

Construction Methods

AND
EQUIPMENT

MAY, 1959

PRICE \$1.00

A M C G R A W - H I L L P U B L I C A T I O N



A 9-yd load of sandy clay boils up into the bowl of the scraper "Pony Express" as a push-tractor kicks the rig out of the pit and on its way to the fill. The Connecticut grading job is 200,000 yd.

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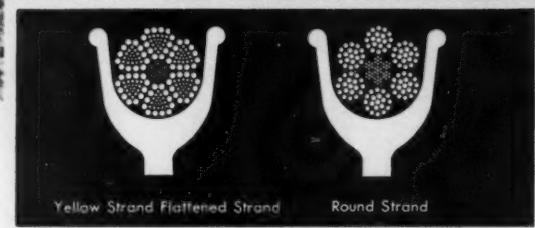
HOW

Houston Contracting Company

CUTS WIRE ROPE COSTS 50% ON TOUGH BACKFILL JOB

This was a tough one. Wide ditch — heavy, wet dirt — high line speeds over a short distance — severe reverse rope bend — an extra large bucket. Rapid wear and fatigue actually tore apart ordinary round strand rope to the tune of five to seven 50' lengths per day. Then Houston Contracting Company selected Yellow Strand Flattened Strand Wire Rope. Now, one length per day is used in place of five to seven. They cut rope costs by 50%, saved substantially in man-hours and machine down time.

What made the difference? Compare the two



illustrations above: See how each strand of Yellow Strand Flattened Strand is laid up in a triangular pattern. Contact with the sheave groove is made by *many* wires instead of just a few. Note the marked increase in compactness in the Flattened Strand, with greater crush resistance and 10% greater metallic area. This is the design that makes ropes, sheaves and drums last longer! For complete details about Yellow Strand Flattened Strand, contact your distributor or check with us. Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

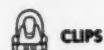
Yellow Strand®



WIRE ROPE



SLINGS



CLIPS

B.F.Goodrich

V belt briefs

TIPS ON THE CARE, MAINTENANCE AND SELECTION OF V BELTS FOR INDUSTRY

The right way to install and run-in V belts

To get the most possible life out of a set of V belts you've got to install them and run them in properly:

To install V belts:

1. Move driver unit toward driven machine so that belts may be placed in sheave grooves by hand.
2. Work belt slack to top side of drive.
3. Move driver unit back into position, eliminating all belt sag.
4. Check sheave alignment.

To run-in V belts:

1. Start unit and operate long enough to permit belts to properly seat in grooves.
2. Stop unit. Adjust centers as necessary until all belts have proper tension.
3. Review adjustment from 24 hours to 48 hours after drive is in operation. This is important, for new belts stretch slightly and seat in grooves before reaching their working lengths.

It pays to keep belts stored properly

V belts should be stored in a cool, clean, dry place. Avoid heat and direct sunlight. Do not hang on nails or other small objects which might cause a sharp bend or tension that would result in a permanent set in V belt. Oldest belts should be used first to keep fresh stock. Matched belts should be banded together so they don't become separated.



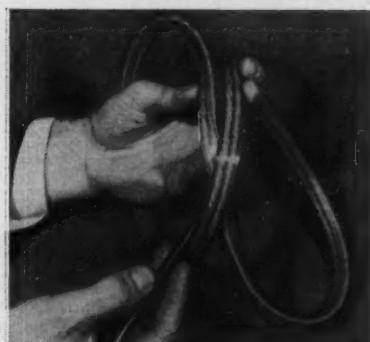
BELTS BOIL IN HOT MILL SAND — The V belts driving this ball mill help grind hot sand, heated to 260°, to a fluffy powder used for fine glass, pottery, cosmetics. Ordinary V belts were lasting one to two years. B.F.Goodrich Grommet belts replaced them, have lasted over five years. Grommet belts stay cooler because they generate less internal heat and are made of a rubber that takes higher temperatures.

What caused this V belt failure?



Answer: Prematurely worn sides are caused by grit, dirt or any such abrasive contact. Misalignment often causes wear on one side only. To prevent, align the sheaves, checking with straight-edge or cord. Keep belts and sheave grooves clean.

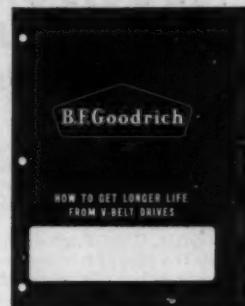
Take a look inside with this X-ray of a Grommet belt



This model of a B.F.Goodrich Grommet belt was made of a transparent, flexible material so that you can see its grommet construction. The two endless loops you see are grommets, the load-carrying members of the B.F.Goodrich belt. These are made by winding heavy cord on itself to make an endless cord grommet.

In the actual belt, these grommets float in a bed of solid rubber. You can see why every part of the belt is equally flexible—there are no stiff plies to resist bending. Most cord failures occur where cords overlap. But in the B.F.Goodrich Grommet belt with endless cord construction this cause of failure is eliminated.

B.F. Goodrich V belt manual



Your B.F.Goodrich distributor has a new maintenance manual that tells you how to get longer life from your V-belt drives. Its 12 illustrated pages contain information on how V belts work, how to select V belts that fit, how to install, how to keep them running, and how to spot trouble.

Ask a factory-trained specialist

For help in selecting V belts for any kind of service, call the man who is a specialist in V belts—your B.F.Goodrich distributor. He can help you cut costs by getting longer life from your V belt drives. *B.F. Goodrich Industrial Products Company, Dept. M-595, Akron 18, Ohio.*

B.F.Goodrich V belts

Bridge Forming



Symons Forms Cut 100 Days Off Bridge Forming Job Ease of Erecting and Stripping Reduces Pouring Time

Contractor Lee Hoffman, Beaverton, Oregon, was given 320 days to pour 4,000 cubic yards of concrete for a bridge over Myrtle Creek in Oregon. Job was complete in 220 days or only $\frac{1}{3}$ the time allotted.

Harry Pajutte, Chief Engineer for Hoffman, credits the ease of erecting and stripping Symons Standard High Strength Forms with contributing substantially to cutting pouring time, reducing number of men required on job, and providing greater mobility for the pouring equipment. Only

JUST 3 PIECES



3,144 square feet of panels were required for the 160,000 square feet of forming.

Symons Forms, Shores and Column Clamps can be rented with purchase option. Facts on Symons products and engineering service available upon request.

Symons
SYMONS CLAMP & MFG. CO.

4255 Diversey Avenue, Dept. E-9
Chicago 39, Illinois

Construction Methods AND EQUIPMENT

MAY, 1959

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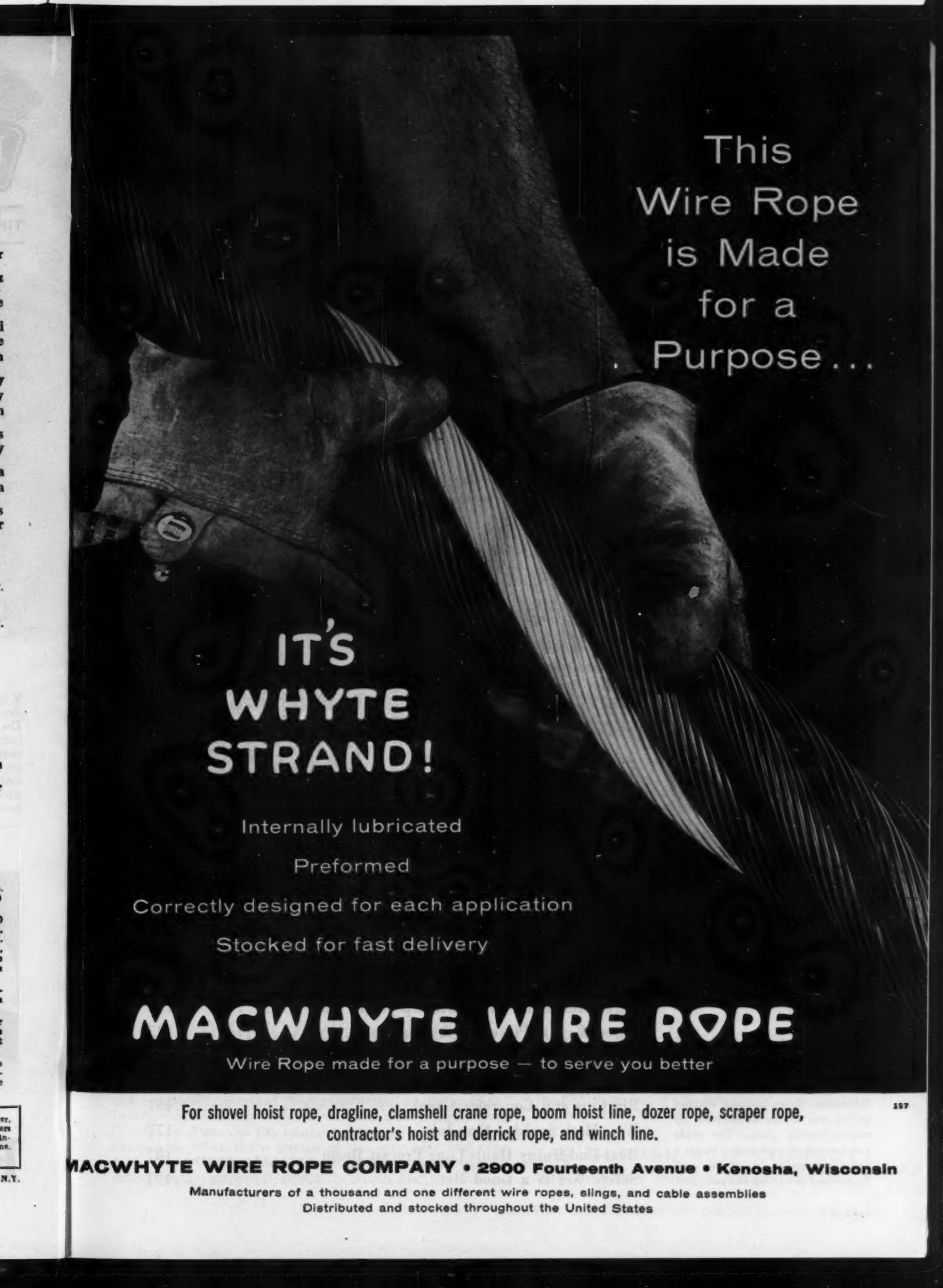
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Manufacturers of a thousand and one different wire ropes, slings, and cable assemblies
Distributed and stocked throughout the United States



ON THE COVER

Brancifort Bros. Construction Co., of Cromwell, Conn., are as modern as today's television programs: their two new Michigan 110 scrapers are named Wells Fargo and Pony Express. Other rigs carry such names as Gunsmoke and Cochise. The two Michigans, push-loaded to 9 yd by an International-Harvester TD-18 tractor in as little as 20 seconds, each move 1,300 yd per 9-hour day on a short-haul job at Middletown.

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NEXT MONTH

Salvage operations raise to the surface two concrete pontoons that sank mysteriously in the Duwamish Waterway at Seattle, Wash., last December. Barge-mounted winches pulled one of the boxes from its watery resting place. The other was dewatered with pumps inside a cofferdam made out of the wall forms used in casting the pontoons.

MAY, 1959

Pay Dirt in This Issue

Moving Dirt

For the Jet Age

The new 130-ton capacity LeTourneau double-bowl scraper is part of an earthmoving fleet that is digging and hauling 50,000 yd a day for the Washington International Airport.



Offshore Pipelaying Rig

Wades in 200 ft of Water. 96

To lay a 12-ft concrete pipeline 5 mi out into the Pacific Ocean, the contractor developed a unique rig that floats into position, then stands up on its legs to lay pipe.



U. S. Contractors

Build Mid-East Port 157

Advanced U. S. construction know-how combines with old Arab customs in the operation of one of the world's biggest prestressed concrete plants on a Middle East harbor project.



Tubular Leads on Big Crane Handle Long Piles	92
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GORMAN-RUPP DIAPHRAGM PUMP



Gorman-Rupp Model 3D-8BR6 pumping in 60-ft. deep excavation for California bank building.

guaranteed to outperform them all!

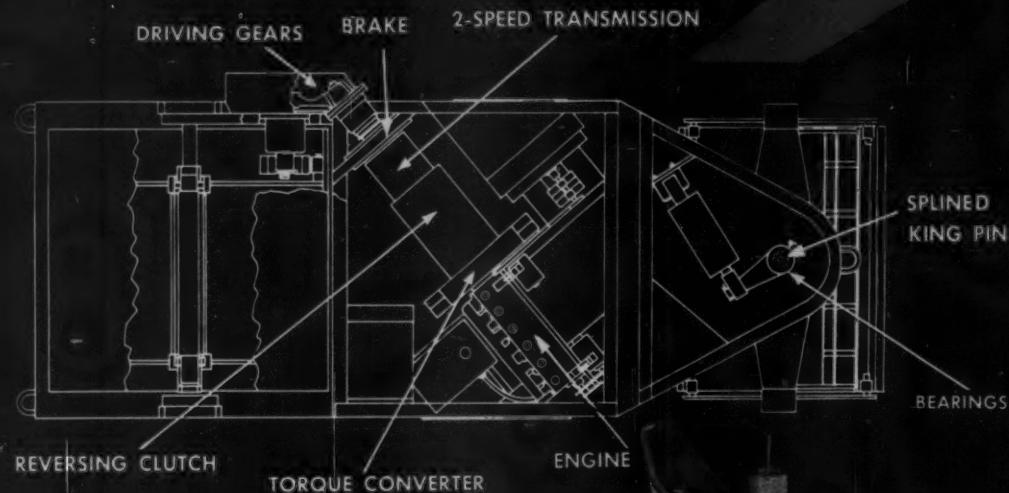
When this pump was purchased by the contractor, he bought it with the guarantee that it would "pump more dirty water, run more smoothly, outlast and outperform any similarly sized and comparably powered diaphragm pump on the market." In fact, the distributor was authorized to put the Gorman-Rupp Diaphragm Pump on the toughest pumping jobs—in competition with other make pumps of the same size and type. And—if the Gorman-Rupp did not prove to be the best all-around pump, we would accept its return and pay the user

any installation expense. This pump and its guarantee are available to you. If there is any greater satisfaction than in being able to buy with that kind of assurance, it's in being able to build and sell with that kind of confidence.

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NEW DIRECT-IN-LINE DRIVE GIVES YOU FULL POWER...

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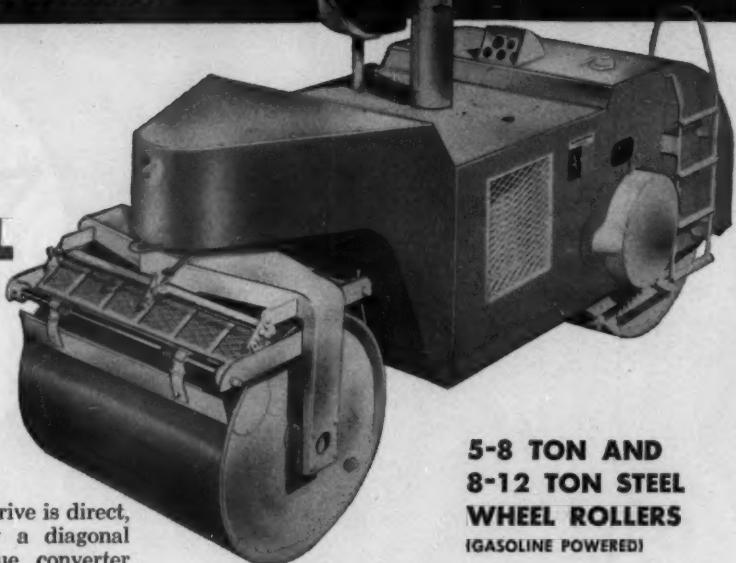


in these
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STEEL WHEEL
ROLLERS

*The roller built with
the maintenance
man in mind . . .*

The power-train from engine to roll drive is direct, an engineering feature attained by a diagonal mounting of the engine and torque converter transmission between the drive and guide rolls. No power-robbing chains, jackshafts, belts or right angle drives.

Another exclusive feature: heavy KING PIN is not only splined but is also clamped securely to the steering sector of the guide roll to completely eliminate side movement of the roller.



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8-12 TON STEEL
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(GASOLINE POWERED)

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A Subsidiary of American-Marietta Company
ELM GROVE 4, WISCONSIN

IT'S THE 25-D—all over the country

A still finer workhorse
in the 3/4-yard field!



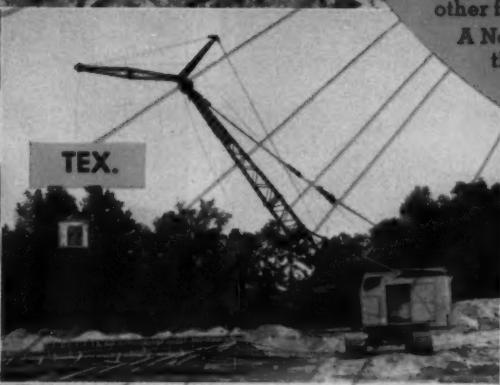
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COLO.



FLA.



TEX.



ME.



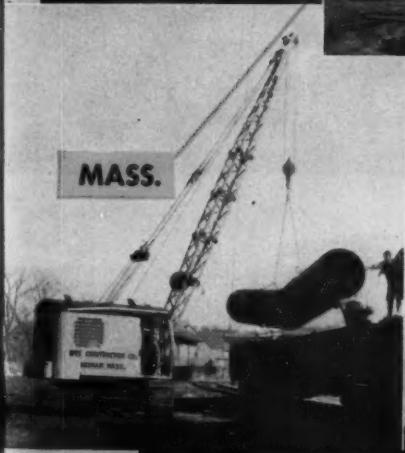
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*Always
Ready to*

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NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS
3/4 Yd. to 2 1/2 Yd.
Capacity

CRANES
13-Ton to 50-Ton
Capacity

DRAGLINES
3/4 Yd. to 3 Yd.
Capacity

PULLSHOVELS
3/4 Yd. to 2 1/2 Yd.
Capacity

TRUCK CRANES
25-Ton and 35-Ton
Capacity



1. NO HARMFUL DEPOSITS, no stuck rings or valves in diesels lubricated with Texaco Ursa Super Duty, a series 3 oil, because Ursa is refined and processed specifically to keep engines clean and on the job with minimum maintenance.

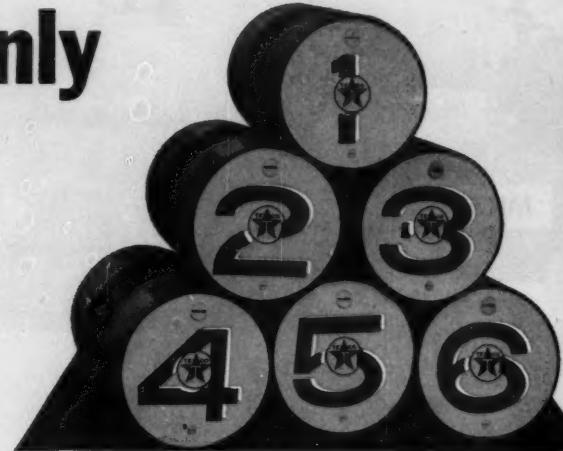


2. DUST AND DIRT STAY OUTSIDE when you lubricate wheel bearings, chassis and water pump with Texaco Marfak Multi-Purpose 2. Marfak stays put despite shock, vibration and moisture.

Why you need only 6 lubricants to handle all your lubrication

The Texaco Simplified Lubrication Plan combines special and general-purpose lubricants to handle the greatest variety of equipment with the fewest possible lubricants.

Every Texaco Simplified Lubrication Plan is organized for a particular job. That way you get top performance from every piece of equipment, plus all the advantages of low lubricant invento-



tory: fewer manhours spent in storage and handling, less paperwork in ordering, less chance for mistakes in application. A Texaco Lubrication Engineer will be glad to develop a Texaco Plan to meet your needs. Just call the nearest of the 2,000 Texaco Distributing Plants, or write:

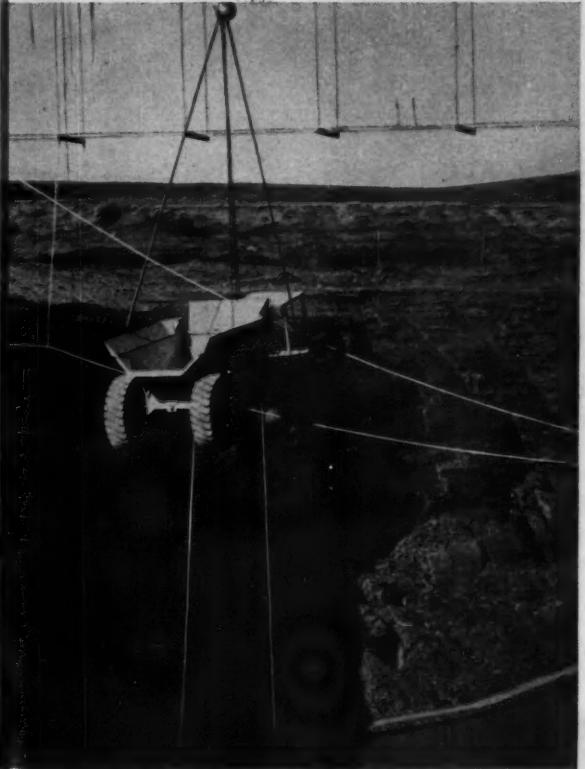
★ ★ ★
The Texas Company, 135 East 42nd Street,
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lubricate
Texaco
e shock,



3 SHOCK AND STRAIN won't break the tough film that Texaco Universal Gear Lubricant EP puts on differential and transmission gears. Universal Gear Lube is designed to take highly concentrated extreme pressure loadings.



5 MOISTURE CAN'T PENETRATE cables and wire ropes lubricated with Texaco Crater, because Crater lubricates all the way through, works itself between the strands to protect against rust, dirt and abrasion.



4 HYDRAULIC SYSTEMS STAY CLEAN, give steady, powerful hydraulic action, with Texaco Regal Oil R&O. It's inhibited to prevent rust, minimize oxidation and foaming. Keeps air compressors on the job longer, too.



6 CRAWLER MECHANISMS LAST LONGER with Texaco Track Roll Lubricant. It insulates against moisture, cushions shock, minimizes wear.



LUBRICATION IS A MAJOR FACTOR IN COST CONTROL (PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

engine power

BY CATERPILLAR

THIS PORTABLE PLANT ANYWHERE WITH CAT



Power for A. & E. Paving Company's continuous-mix portable bituminous plant is furnished by three Caterpillar Diesel Engines. A D342 powers the crusher directly through a uni-

versal joint and shaft. All conveyors and four deck screens are run by a Cat D318 Electric Set. The hot plant—now set at 209 tons of bituminous mix per hour—is powered by a D353

THIS is A. & E. Paving Company's continuous-mix portable bituminous plant. Headquartered at Arcata, California, the combination crusher, dryer and hot plant can operate anywhere from Arizona to British Columbia without regard for availability of other power sources. When it was time to select his type of electric power for the spread, president Sam Parnum chose Caterpillar Portable Electric Sets with good reason.

Working anywhere within so vast an area, he

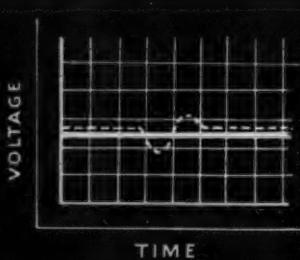
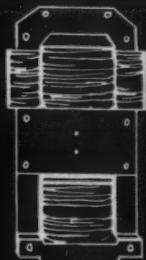
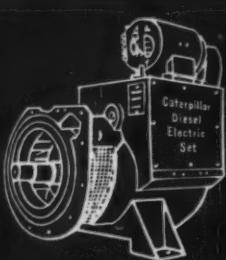
wanted absolutely dependable power. He wanted to be sure of nearby service anywhere the plant moved. To get full production and power protection, he had to have units that would deliver the power wherever they went.

When you outline portable plant requirements like this, the answer is Caterpillar. They *are* dependable under all conditions. Wherever you take them, you're always close to a Caterpillar Dealer, his staff of specialists and any part you'd ever need. And your need for

Cat Generators are self-regulated, compact, simple to operate. They're quality built for long life.

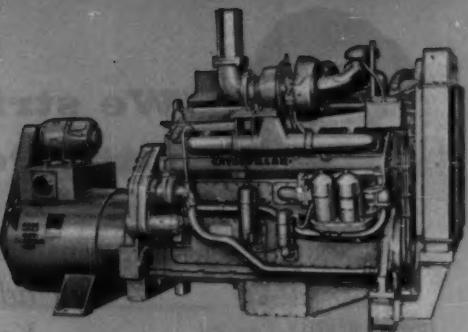
There are no moving parts in the generator regulator. Voltage is steady from no-load to full load.

Electric motor starting ability is excellent—and there's capacity to handle the surge of heavy loads.



CATERPILLAR

IS SURE OF POWER DIESEL ELECTRIC SETS



D353 (Series C) Electric Set



Electric Set from feeder to conveyor. Crusher varies from 100 to 300 tons per hour, depending on size and strength of rock —at least 200 tons with river run. Plant has ample power for

any rock. Lots of power for feeding and to take material away means full capacity operation under trying conditions. Heater generates up to two million BTU for drying aggregate.

are
t 209
D353

to be
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have
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s like
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you're
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llent
the

parts will probably be minor, as you can see when Mr. Parnum says, "We have not had a nickel's worth of trouble on any of the three engines since they were purchased. Fuel costs," he adds, "are low, too."

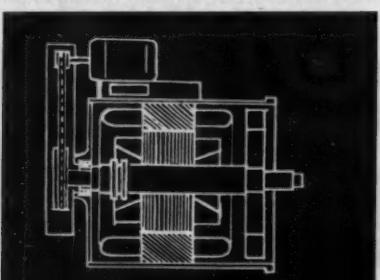
When you buy new equipment, or repower to restore old equipment's production ability, specify Caterpillar. It's the sure way to get high production, long life and low cost. For data on the full line, write to us for "Caterpillar Engines," a useful reference book.

Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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Installation is easy—with no complicated switch gear or external regulators required.

Close coupling with small frame size, top-mounted exciter and single large bearing mean shorter over-all length.



Each of these features is a buying advantage . . . you get them all in a Cat Electric Set

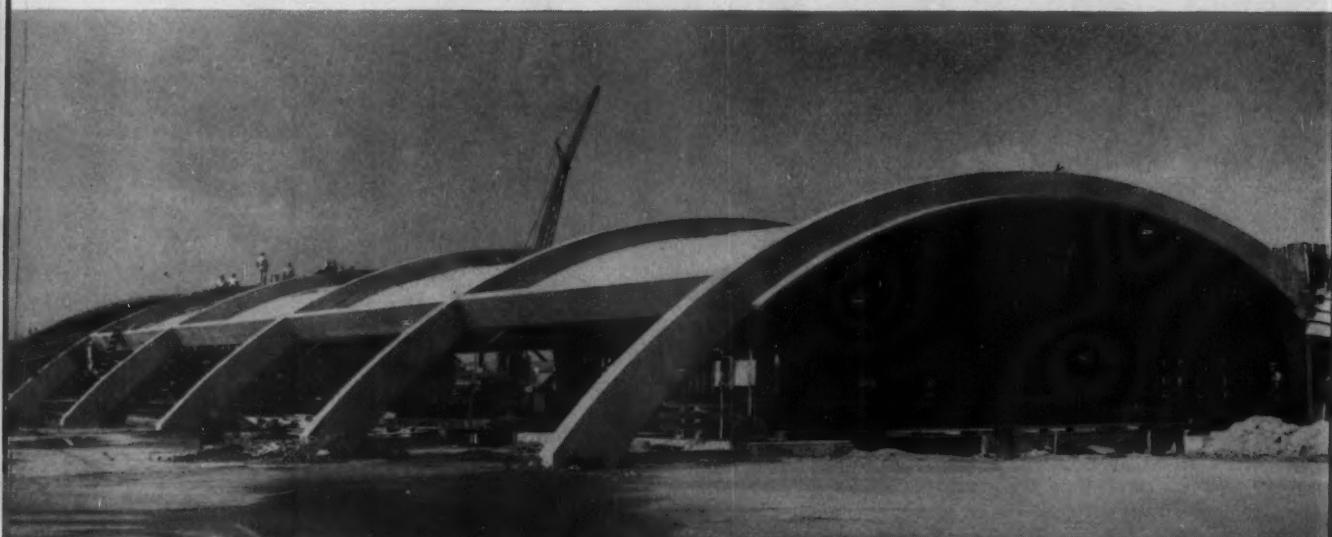
- Lowest over-all cost per operating hour
- Less down time due to power failure or engine failure
- Power specified is the power you get in full
- No additional operating personnel required due to unit's simplicity and self-regulating design



EDWARD D. KELLY, President
Interstate Construction Corp.,
Kansas City, Missouri

"We stripped this form in 3 days...
with POZZOLITH concrete"

"This accelerated schedule saved us the cost
of additional forms on the new
Kansas City Air Terminal job"



ROLLING FORM for thin-shell roof is stripped on third day. High early strength of POZZOLITH concrete allows accelerated production schedule . . . cuts contractor costs significantly.

NEW TERMINAL FACILITIES at Municipal Airport, Kansas City, Missouri • Contractor: Interstate Construction Corp., Kansas City, Mo. • Architect-Engineers: Cooper-Robison-Carlson-O'Brien, Kansas City, Mo. • POZZOLITH Ready-Mixed Concrete; Concrete Materials, Inc., Kansas City, Kansas

"Concrete strength of 3750 psi in 3 days—that's the kind of performance we got with POZZOLITH concrete on the new Kansas City Municipal Airport Terminal job. Stripping our big rolling form on the third day enabled us to place one 48-foot roof shell section each week."

"To reach the required design strength in minimum time, the job called for extremely low-slump concrete . . . yet it had to be workable enough to consolidate around reinforcing steel in these 3-inch thin-shell sections. With POZZOLITH we got excellent workability, high early strength, and a superior finish with no honeycombing or cracks."

"The Master Builders field man worked closely with the ready-mix concrete producer and concrete technician on-the-job to aid in maintaining batch-to-batch uniformity—so important in critical concreting of this type. POZZOLITH concrete and Master Builders field service gave us an important edge over time and costs on this job."

For lowest cost-in-place...superior quality concrete—there's no equal to today's POZZOLITH. Call in the local Master Builders man to demonstrate how POZZOLITH can help put you ahead on your very next job.

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Construction News From Washington

Washington, D.C.
May, 1959

Roadbuilding on Capitol Hill

Congress now is going to work in earnest on legislation to assure construction of the 40,000-mile network of interstate highways at the planned rate.

The House Public Works Committee is set to approve a bill sponsored by Committee Chairman George H. Fallon to continue allocations to the states at the current \$2.5-billion annual rate. This authorization legislation is necessary so that the allocations can be made to the states this summer for work in the year beginning July 1, 1960.

Finding money to pay for a continued high level of interstate highway construction is the more difficult problem of the House Ways and Means Committee. Without some new source of revenue the Highway Trust Fund would have a deficit of \$1.1 billion by 1961 and \$2.2 billion by 1962 at the current rate of construction. Under a pay-as-you-go program, construction would have to be cut back sharply.

The committee hopes to present this month a financing plan that both the Congress and the White House can accept. The best bet is that the plan will involve bond financing to tide the highway program over the money crisis. Another possibility is diversion of a portion of the excise taxes on automotive vehicles and parts to pay for road construction. But that probably would run up against serious objections from the President.

Airports Need \$1.3 Billion of Construction

Municipal and private airports of the nation need to complete \$1.3 billion of improvements between now and 1962. The airport operators supplied the information to the Federal Aviation Agency, which tabulated the data in a 504-page report.

More than \$636 million of the construction total is required to serve jet aircraft at 95 airports. Increased commercial traffic by conventional planes at 950 airports accounts for \$367 million. The remaining \$282 is needed to take care of the growth in general aviation—business, agricultural, pleasure, and instruction flying—at 2,279 smaller airfields.

An Old Rivalry

Asphalt won a long fight a few months ago when the Air Force agreed to take competitive bids for both asphalt and concrete pavement for specified runway areas (CM&E, Jan. p. 12).

But asphalt lost a battle when the architect-engineers for the new International Airport near Washington, D.C., refused to consider asphalt-paved runways and specified portland cement concrete exclusively.

continued on next page

Missouri
Architect
Pozzolith
Kansas

Performance we
Local Airport
enabled us to

b called for
high to con-
ditions. With
a superior

mix concrete
batch-to-
Pozzolith
edge over

's no equal
n to dem-
y next job.

York 17, N.Y.

RS

e of hardening

Construction News from Washington . . . continued

The Federal Aviation Agency has released a report to answer critics of this decision. The report says the team of architect-engineers, headed by Ammann & Whitney, found that portland cement concrete alone would meet the engineering requirements for the three runways that will handle big jet airliners at the airfield. It said the engineers found that rigid pavement was superior to asphaltic concrete in almost every respect except first cost.

Rural Roads Need Attention

Nearly 30% of the more than 500,000 miles of rural roads in the U.S. are dangerous, the Bureau of Public Roads says in a 232-page report to Congress.

These roads, BPR says, have surfaces less than 20-ft wide—at least 4 ft narrower than today's standards. The report says that any road with a surface less than 22 ft wide is considered dangerous.

Current roadbuilding programs include plans to improve much of this rural road mileage over the next few years. But the report says interim safety measures should be taken at once. These would include resurfacing with non-skid materials.

Holding the Line on Prices

Steel, cement, and other construction materials would be affected by a hotly disputed government price review bill brought before Congress in a barrage of publicity.

Proposed by Sen. Joseph O'Mahoney, it would require most major firms in the country to post notice of proposed price increases with the government 30 days before putting them into effect. The Federal Trade Commission then would hold public hearings. It could not reject the price increases but would rely on moral suasion, supported by public opinion, to curb price hikes.

Sen. Estes Kefauver scheduled a full two weeks of hearings on the bill before his Antitrust and Monopoly Subcommittee. Among those invited to testify were Chairman Roger Blough of U.S. Steel Corp., Steelworkers chief David McDonald and General Electric Co. Chairman Ralph Cordiner.

Terms of the O'Mahoney bill would apply to any company with a capital and surplus of \$10 million in an industry in which 50% of U.S. sales are made by eight or fewer firms—a provision so sweeping that it would apply to practically all major companies in the country.

More Rivers and Harbors Work

There's a good chance that Congress will vote another omnibus rivers and harbors bill this session, even though it approved such a bill last year. The reason is that at least a dozen new projects have been reported favorably to Congress during the last few months, and some of them require quick action.

Where tires are put to the test

You can do more for less on Tru-Seal Tubeless Rims

Wherever there's work to be done that's really tough on tires—you can be sure of this: You'll get more out of your tires — at lower cost — when they're mounted on Tru-Seal Tubeless Rims by Goodyear.

Tru-Seal is the only practical way to seal a multiple-piece rim. And, like all Goodyear rims, it provides other dollars-and-cents advantages:

Unusual Strength: An exclusive double-welding process and added support at points of greatest stress make present-day Goodyear Rims far stronger than previous rims.

Ease of Tire Mounting: No tube and flap troubles.

Special Tools: Goodyear provides both hydraulic and hand tools especially made for off-the-road equipment.

Bond-a-Coat Finish: This protective coating affords long-lasting resistance to rust and corrosion.

If you have a rim problem, talk it over with the G. R. E. (Goodyear Rim Engineer). He'll save you time and money by helping you select the type and size of rim best suited to your needs. Write him at Goodyear, Metal Products Division, Akron 16, Ohio, or contact your local Goodyear Rim Distributor.



Buy and Specify **GOOD YEAR**
METAL PRODUCTS DIVISION

*More tons are carried
on Goodyear Rims
than on any other kind*

Tru-Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Watch "Goodyear Theater" on TV—every other Monday, 9:30 P.M., E.D.T.

dated edition of last year's
to the construction industry
by publication of new
information on how to
keep equipment operating
smoothly. It also shows
what can be done to
keep equipment operating
smoothly.

11% Ahead at



Phillips (left) and Morgan (center) show Williamson how planned lubrication prevented equipment breakdowns.



Williamson (left) and Morgan go over important lubricating points of truck used on Dyberry job.

Winter Shutdown!

**Mobil PM System Given Credit by Hunkin-Conkey
for Helping Speed Up Dyberry Flood Control Dam and
Reservoir Project of U.S. Army Corps of Engineers**

WHEN Hunkin-Conkey Construction Company, Cleveland, O., closed down operations for the winter at the Dyberry Flood Control Dam and Reservoir near Honesdale, Pa., it was 11% ahead of job schedule. Exclusive use of the Mobil PM System and Mobil products, resulting in better maintenance organization and performance, is given a large share of the credit for this fast progress by Frank S. Morgan, Hunkin-Conkey's General Superintendent on the Dyberry job.

Major equipment in use at the Honesdale project includes 12 Euclid trucks, seven bulldozers, three mixer trucks, two tractor-mounted drill rigs, two 2½-yard shovels and a one-yard drag-line. Planned lubrication made possible the steady, day-after-day availability of this equipment—an important factor in helping Hunkin-Conkey keep ahead of schedule.

This case history clearly demonstrates the



R. G. Williamson, local Socony Mobil representative (center), checks Mobil PM System equipment sheet with General Superintendent Frank S. Morgan and Equipment Superintendent L. C. "Joe" Phillips.

practical value of Mobil's PM System and Mobil products for contractors in saving valuable job time... boosting job profits... and in keeping their equipment working on the job *all through the job!*

Available—film on equipment safety, maintenance.
Call nearest Socony Mobil office.

CONTRACTOR PM SYSTEM INCLUDES:

1. **Record Folder**—provides identifying date for each separate piece of equipment and holds equipment records.
2. **Operator's Recommendation Chart**—lists the correct lubrication recommendations for each piece of equipment.
3. **Weekly Service & Inspection Report**—

an up-to-date record of condition of equipment, work to be done or completed.

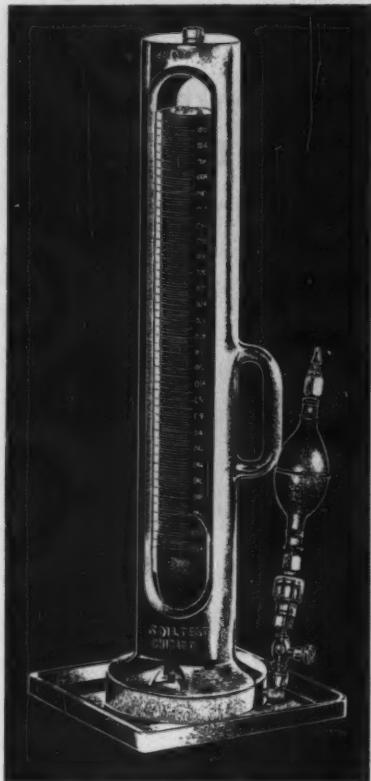
4. **Delivery Ticket**—lists petroleum supplies delivered to equipment on the job.
5. **"Squawk" Sheet**—used by equipment operator to point out trouble spots that may need immediate attention.

Mobil

Correct Lubrication

ANOTHER REASON YOU'RE MILES AHEAD WITH MOBIL

SOIL COMPACTION



VOLUME MEASURE
for fast,
accurate
IN-PLACE
DENSITY
TESTING of SOILS

PRICE \$95.00 F.O.B. CHICAGO

Write for complete
Catalog of Engineering
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Job Talk . . .



Steel Forms Fit Between Joists

Telescoping steel pans that fit between the flanges of steel joists in the floor system of the Medical Research Building being erected in Miami, Fla., cut slab forming costs to \$1.89 per sq ft.

The joists are 12-in. Junior Beams manufactured by Jones & Laughlin Steel Corp. They span 22 ft across bays between main structural members. Spacing between joists is 2 ft. Ends of the telescoping pans are set over the flanges of the joists a distance of

3/8 in. The pans are adjustable to span any distance between 18 and 32 in.

The telescoping forms provide a safe, smooth surface for workmen. They are easily removed when the concrete deck slab gains strength by telescoping them together so that they drop from between the joists. Developed by a group of Miami engineers, the steel pans will soon go on the market nationally under the name Bobforms.



Lightweight Blanket Insulates Concrete

A new insulating blanket enabled J. W. Bateson Co., Inc., of Dallas, Texas, to pour concrete for a Post Office in Omaha, Neb., almost continuously last winter.

The blanket is a 2-in.-thick batt of balsam wool sealed in a protective envelope of polyethylene plastic. It comes in 50-ft rolls, 5-ft wide; one man can handle it.

Bateson placed the blanket on top of a layer of sisalkraft paper covering the 2½-in.-thick concrete floor slabs. The floor is a waffle grid formed with metal pans. Salamanders in the tarp-enclosed floor below the slab heated the freshly poured concrete. Heat loss was so low that temperature

continued on page 22

30' OF WATER OUT OF THE PICTURE!

Miles of 96" pipe placed in the dry at an average rate of 150' to 200' per day

*Wolfe River Interceptor #1, Memphis, Tennessee
Contractor: Hardwick-Ingram Co., West Memphis, Arkansas*

How was it handled? By a **MORETRENCH WELLPOINT SYSTEM** pumping on one side of the trench only.

This is how experienced contractors free themselves to effect important savings in work procedures on wet jobs.

Get WATER out of the picture—
then **DIG . . . IN THE DRY!**

A Moretrench Wellpoint System underwrites your progress. Call us for help on any pumping problem, regardless of size.

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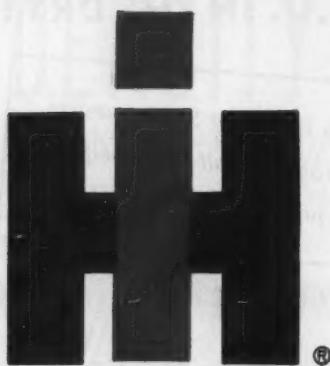
WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington

CANADIAN REPRESENTATIVE: Geo. W. Crothers Limited, Toronto, Ontario

BRAZILIAN REPRESENTATIVE: Oscar Tavares & Co., Ltd., Rio de Janeiro

NEW INTERNAT

New look! New custom interiors!



International Harvester Company, Chicago
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick®
Farm Equipment and Farmall® Tractors

Engineered with more than style in mind,
this INTERNATIONAL pickup combines
ruggedness and ability! Choose from two
body types—extra-wide, extra-capacity
"Bonus Load" or standard (as shown). Low-
to-ground design makes for convenient load

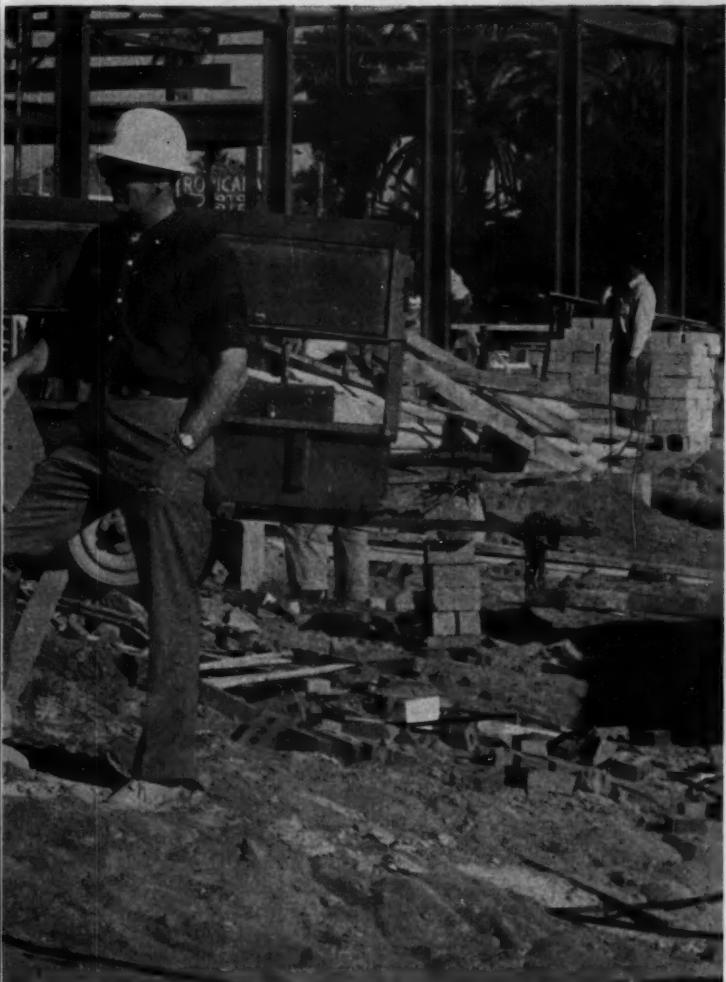
accessibility. Reinforced with box-type
construction and all-steel ribbed floor, these
are among the toughest pickup bodies in
the business. INTERNATIONAL gives you
everything for comfort, from new instru-
ment panel to accelerator pedal!

INTERNATIONAL® TRUCKS

WORLD'S MOST COMPLETE LINE

INTERNATIONAL® TRUCKS

New loadspace! New truck-designed power!



Shipped within 24 hours of order from INTERNATIONAL Truck Sales Processing Center! This new INTERNATIONAL model BCF-182 six-wheeler, with 96-in. bumper-to-back-of-cab dimension and 28,000 lb. tandem axle, is equipped with body, hoist, frame reinforcements . . . all the standardized equipment you need! Besides fast delivery it offers "take-any-terrain" ruggedness and easy-handling maneuverability for "tight" working conditions . . . husky "six" or V-8 power. Ask your INTERNATIONAL Dealer for full details.

You name it—they do it! NEW INTERNATIONAL models up to 33,000 lbs. GVW are ready to handle any assignment . . . the tougher the better. They're powered by truck-specialized "six" or V-8 engines. They're distinctively and durably styled with dual headlights and the largest one-piece anodized aluminum grille on any truck. They're the newest additions to the world's most complete truck line . . . at your INTERNATIONAL Dealer's now!

Choose from 5 economy-proved INTERNATIONAL "SIXES"



Choice of 220, 240, 264, 282 and 300 cu. in. displacements

All-time, any-time favorites for efficient power at low cost . . . now better than ever! They're short-stroke, low rpm. engines designed for truck loads, truck speeds, truck work exclusively. Latest improvements through research extend engine life and reduce maintenance. Available in a range of horsepower to suit your needs exactly.

Optional . . . 3 new value-proved INTERNATIONAL V-8's

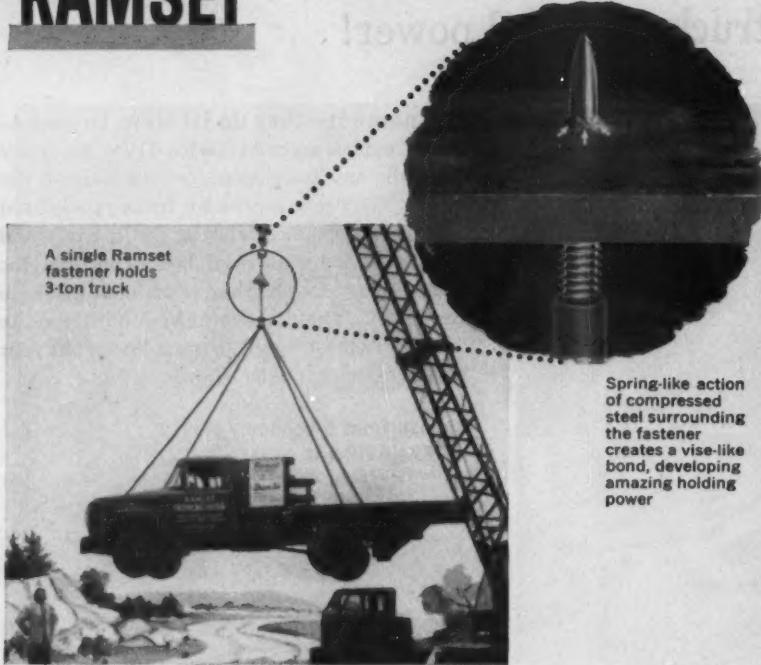


V-266 154.8 hp.
V-304 183.1 hp.
V-345 196.7 hp.

Real money savers that bring brand new economy to V-8 operation! They deliver astonishing mileage from regular gas . . . smooth, lively power with next-to-no oil consumption. Proven by tests. Proven on actual truck jobs. Optional in new INTERNATIONALS from light-duty pickups to medium-duty stakes to heavy-duty six-wheelers.



ONLY RAMSET



offers austempered fasteners with such superior holding power

Even under the most demanding workloads, Ramset's austempered Red-Tip fasteners assure more holding power and greater fastener strength. Austempering, Ramset's high-heat slow-quench treatment, puts extra strength, toughness and dependability into every Ramset Red-Tip fastener.

Ramset's wide variety of fastener sizes puts the right fastener on each job—you don't have to "make-do" with off-size pins or studs. Ramset assures positive, guaranteed fastenings into tough steel, concrete or masonry faster and easier, and at lower in-place cost. Consider Ramset's many advantages and the "100-for-100" guarantee—call your Ramset dealer (under "Tools" in Yellow Pages) for details.



In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set[®] hammer-in tools for light fastening, and Ringblaster[®] heavy-duty kiln gun.

Ramset[®] Fastening System

WINCHESTER-WESTERN DIVISION • OLIN MATHIESON CHEMICAL CORPORATION
12103-E BEECH ROAD • CLEVELAND, OHIO

JOB TALK... Continued from page 118

ature differential between the top of the slab and the bottom was only 4 deg.

The blanket cut down on heating costs and also reduced curing time considerably. Sealing the edges of the blankets with masking tape made a water-tight seal that held moisture in the concrete. The blankets were left in place for only 36 hours.

Despite the consistent cold weather, Bateson built four stories of the building during the winter. "We placed about 100,000 sq ft of concrete slab that we wouldn't have gotten without the insulating blankets," says project manager Randy Butler.



Does More Than Dig

The machine did the final sloping of the steep banks of the pit. It moved dirt from the perimeter of the hole, and a bulldozer then pushed the material within reach of a dragline bucket that carried it out of the pit.

Next the rig turned to cutting out the footing excavations in the floor of the pit. It cleaned out the footer holes so close to plan dimensions that no forms were needed to hold the concrete.

The Gradall also lent a hand in the concreting of the footings by rehandling the buckets lowered to the bottom of the hole by a crane. Fitted with a hook at the end of its boom, the rig carries the concrete to pouring points beyond the reach of a crane.

ON ALL YOUR BIG CONTRACTS...

Clam-action 4-in-1 can "take over" an endless list of big-pay jobs!

"Back-dragging" bank material by the truck-load, this TD-15 4-in-1 shows one (of dozens!) of its exclusive clamshell applications! This long-reaching action can also grade slopes; clean ditches; give

space-saving, one-gulp bucket-full bites of loose materials; load stumps or other "impossibles"; give positive bottom-dumping that eliminates the sticky materials problem!



As an inch-close-accurate "carry-type scraper" the 4-in-1 can often double for blade grader or tractor-towed scraper. And the 4-in-1 can do closely-controlled grading, stripping, or spreading in quarters too cramped for long-hitched equipment. This TD-20 4-in-1 is the "one-man equipment fleet" on a big housing project.



Simply lift the clam lip (hydraulically)—and the clam-action 4-in-1 gives you a big-capacity blade. Curved to roll the earth—"beefed" to dig hard materials—positively depth-controlled to do accurate work! This contractor-owned TD-20 4-in-1 proves you'd need a full-sized bulldozer, and a good one, to match 4-in-1 dozing performance!

Prove to yourself an International Drott TD-15 or TD-20 4-in-1 gives you mass-production efficiency, along with versatility unlimited! Match exclusive 4-in-1 pry-action break-out and loading capacity against any obsolete single-action loader! Measure shock-swallowing Hydro-Spring advantages. Count the machines a 4-in-1 can replace, to save you up to \$100,000 on equipment. See your International Drott Distributor for a demonstration!

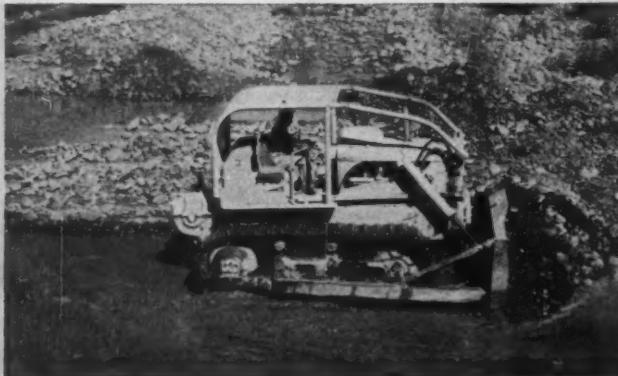


International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

**INTERNATIONAL
DROTT**

Only proven International® delivers bonus

Blade a bonus load—flip the Shuttle-Bar—and you reverse the TD-15 instantly and reposition fast! New TD-20 and TD-15 owners, the country over, are reporting "next-size-bigger" production from these proven models!



Bonus track roller life really counts for this TD-20 owner, working in the "grinding compound" of water-borne granite particles. Precision-lapped, full-floating, metal-to-metal seals in proven International track rollers provide never-before-equalled protection to keep out abrasives and keep lubricant in!

International® Construction Equipment



International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

Years-Proven Planet Power Steering, unequalled undercarriage strength and ease of control make the TD-24 what many contractors call "the rock-dozer special" of all king-sized crawlers. "Live track" steering with both tracks pulling full time means bigger loads every push!



dependability tough-job performance!

Only International provides heavy-duty-type track-rollers—the "originals" since 1956, with cartridge-type, floating metal-to-metal seals. Only International gives you heavy-duty roller bushings and king-size lube reservoirs, plus husky, big-diameter track roller shafts. Exclusive pressure relief passages guarantee positive prevention of seal blow-out or damage from power lubricators! Measure the advantages of proven International roller design in longer wear life, and downtime prevention!

Only International gives you the proven power-transfer efficiency and design simplicity of sintered metal-faced, dry-type engine clutches. With simple, uncomplicated operation, this heat-defying clutch operates efficiently at all temperatures—reduces lever pull up to 50%—needs no cooling system—delivers proven low upkeep!

Only International gives you proven exclusive cycle-speeding, load-increasing features—that pile up bonus production on tough or easy jobs. Only the TD-24 gives you Planet Power "live" track steering advantages—eliminates "dead-track drag"—pulls or pushes the same big loads on turns or straightaways—gives Hi-Lo power-shifting of either track on-the-go! And both TD-20 and TD-15 give you 6-speed, full-reverse transmissions with "single-stick" shift, and fast Shuttle-Bar forward-reverse control!

Big International crawlers give you smooth, high-torque, proven 6-cylinder diesel performance! You get 6-cylinder smoothness without "balancer" complications! For seconds-fast starting, lightning "load-follow" governing, and fuel-metering accuracy, compare proven International diesels!

See what it means in tough-job performance—and all-job bonus production—to arm your operators with proven International crawler advantages. See your International Construction Equipment Distributor for a demonstration!

for this
"sound" of
solid, full-
International
protection

equaled
make the
dozing
steering
er loads



New 19 and 27

- 375 and 250 hp engines
- 30% less body weight
- 14% faster haul speeds



NEW "95" Payhauler

STRUCK: 18 cu. yd. PAYLOAD: 27 tons

The new Model "95" Payhauler moves payloads faster and for less money than any 27-ton rear dump with cycle-speeding 375 hp under the hood and elimination of all free-loading body weight.

Here's why the new "95" earns more for you:

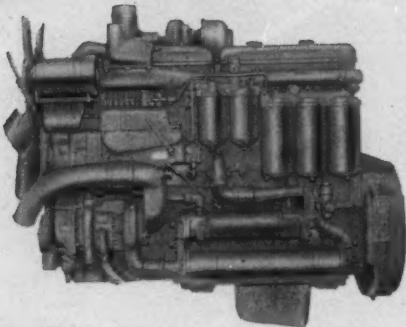
New 375 hp turbo-charged International diesel engine plus rugged yet tons-lighter corrugated body gives best power-to-weight ratio of all similar rigs, helps move payloads 14% faster on all grades both up and down.

Speeds to match all loads and roads with choice of torque-converter with powershift, or 9-speed, constant-mesh transmission. Haul speeds to 38 mph.

Faster reversing, up to 7.1 mph with gear-drive model speeds spotting or positioning for dumping.

Load-speeding safety and unequalled operating ease with power steering, torqmatic braking, and full-sweep vision.

11-second dumping with exclusive inverted hoist action and industry-topping snubber mechanism.



Great new

375 hp and 250 engines

Both Payhauler models have a big power plus under the hood. The "95" is powered by this all-new International DT-817 375 hp turbo-charged diesel while the "65" is powered by the same basic engine, the naturally aspirated D-817, that develops 250 dependable low cost hp. Both are heavy-duty, high-speed, direct-start, 4-cycle, 6-cylinder models thoroughly proved in six years of development and testing. Both are products of 26 years of International experience building heavy-duty diesels for rugged applications.

27-ton Payhauler® models

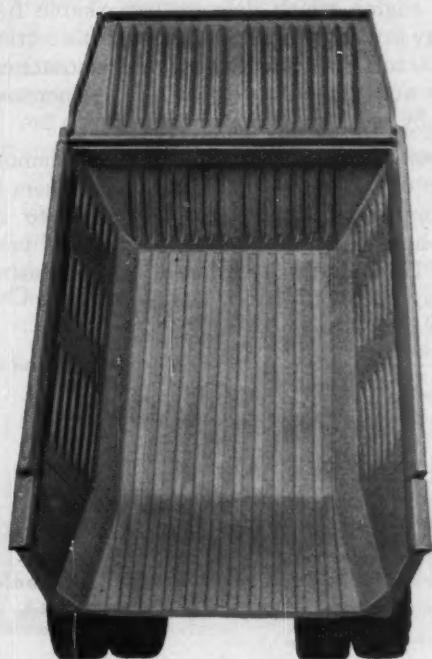
NEW "65" Payhauler STRUCK: 12.5 cu. yd. PAYLOAD: 19 tons

The new Model "65" Payhauler sets new performance standards as the only 19-ton off-highway truck on the market...new 250 hp naturally aspirated International diesel engine...best power-to-weight ratio...new rock-

ribbed body with tons less deadweight...10-speed constant-mesh transmission that helps bonus power speed more paydirt...speeds to 36.37 mph...and cab comfort and safety features that let the operator keep

his mind on his work rather than on truck controls.

For a refreshing experience in what's new in rear dumps, invite your International Construction Equipment Distributor to bring either Payhauler to your job for a show-down demonstration against your present haulers.



BIGGEST BODY IMPROVEMENT IN 25 YEARS

International corrugated quarry and standard bodies are the industry's biggest body improvement in 25 years. Corrugated panels—with triple the strength of conventional flat steel plates—cut body weight 30% in sides, front, canopy, and subfloor at no reduction in strength or protection to operators. Loads being dropped onto the body wear floor are cushioned by up to 26 corrugations in the sub-floor. Patent applied for heated bodies have no cold spots, create no damaging exhaust back pressure. Benefit: haul payloads without hauling up to 5000 pounds of free-loading steel each cycle.



**International
Construction
Equipment**

International Harvester Co., 180 North Michigan Avenue

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



Wading through muck in the dead of winter, Deviney Construction Co., Jackson, Miss., dug 5,000 ft of trench for underground telephone cable. The 460 Utility is equipped with heavy-duty International Pippin backhoe and loader. Backhoe trenches to grade, as deep as 12½ ft.



Backhoe-loader combination: International Wagner

International 460 does own backfilling, and handles a wide variety of heavy-duty materials-handling jobs with front end loader. New Fast Reverser Unit speeds shuttle-type operations with six speeds, coming or going.

6-cylinder brawn

for the

BIG BITE!

INTERNATIONAL® 460 UTILITY TRACTOR

Try an International 460 Utility tractor on your tough trenching jobs and learn quickly how this husky, smooth-flowing power on rubber can earn more for you.

Bite fast and clean in tough-to-dig materials with a big backhoe bucket. More than 5,000 pounds of built-in operating weight—3,185 on the rear wheels alone—assures the brawn you need for top production, and less downtime.

You'll cut operating costs with the Multi-Range 61-hp* engine which delivers remarkable fuel economy at every load-matching throttle setting from 900 to 1,800 rpm. Six-cylinder smoothness—quiet and virtually vibration-free—increases output by reducing operator fatigue.

Ask your IH dealer for an on-the-job demonstration of the new 460 Utility . . . or others in the complete International line, 13.4 to 90 engine hp*. For free catalog, or name of your nearest IH dealer, write International Harvester Company, Dept. CM&E-5, P.O. Box 7333, Chicago 80, Illinois.

*Maximum flywheel hp



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**INTERNATIONAL
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International Harvester Products pay for themselves in use—Farm Tractors and Equipment . . . Twine . . . Commercial Wheel Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois



CHECK THESE
MODERN FEATURES

- ✓ Disc type clutches
- ✓ Forced air cooling
- ✓ Multi-Stage Torque Converter
- ✓ Exclusive Powerflo slide pinion
- ✓ Simplicity of design . . . only 14 gears and pinions
- ✓ Simple jack adjustment of crawler treads
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- ✓ Self-removing counterweight
- ✓ Convertible to crane, dragline and trench hoe

Looking for a
modern
2½ yd. shovel?

SEE THE NEW MANITOWOC MODEL 3100
1½ IN PERFORMANCE
1½ IN OUTPUT

Here is a new Manitowoc shovel in the 2½ yd. range that will outproduce and outperform anything in its class. Completely modern in design, the Model 3100 provides many exclusive, advanced features that contribute to more yardage per shift at lower net cost per yard.

Though it's a big machine, with all the big machine design and construction features, the Model 3100 handles, travels and can be moved from job to job with small machine ease. It's easy to make fast, short moves by truck because a minimum number of rugged, precisely machined fittings allow you to remove the counterweight, complete crawler assemblies and other components without time consuming advance preparation and effort . . . and the 3100's overall maximum outside width of only 11'1" (within ordinary RR shipping clearances) means you can run it aboard a standard flat car, as is, and you're ready to go!

The Manitowoc 3100 is a big producer and big earner on any job—shovel, crane, back hoe, clam or dragline. Ask your Manitowoc distributor for additional details and specifications on the new Manitowoc Model 3100 . . . a really modern 2½ yard excavator.

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

MANITOWOC, WISCONSIN

CRANES SHOVELS DRAGLINES TRENCH HOES
25 TON - 100 TON 1½-YD. - 5½-YD. 1½-YD. - 6-YD. 1½-YD. - 3-YD.

Manitowoc

Tough contracts usually have one ... GARDNER-DENVER



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HIGHWAYS

Inter-American



A MAN WHO
KNOWS WHAT
IT TAKES

Gardner-Denver construction equipment specialists know their field from firsthand experience . . . back up every product with service beyond the call of duty. At Gardner-Denver there's no substitute for men —our 100-year philosophy of growth.

thing in common **EQUIPMENT**



HIGHWAYS ■ TUNNELS ■ PROJECTS ■

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West Virginia Tollway
Connecticut Turnpike
Donner's Pass
New Jersey Turnpike
Kansas Turnpike
Bangor By-Pass

TUNNELS

Hanabanilla
West Delaware
Swift Creek
Washington Aqueduct
Eucumbene-Tumut
Tooma-Tumut
Chicago Water Tunnel

Allegheny Sewer Tunnels
Jaybird Tunnel
Bowery Bay
Fremont Canyon
Boston Water Tunnels
Western Pacific Railway
Roberts Tunnel
Bingham Canyon
Pacific Gas and Electric
Glen Canyon Diversion and Access
Ontario Hydroelectric
Canyon Ferry
Clear Creek
Rampart Range
Mammoth Pool
Cherry Tunnel

PROJECTS

Lucin Cutoff
Calumet-Sag Channel
Chiese Hydroelectric
Snowy Mountain Hydroelectric
Chicago Filtration Plant

Noxon Rapids Hydroelectric
Beauharnois Canal
Little Falls
Lewiston Power
Ferrocarril-Chihuahua-Pacifico
Railway
St. Lawrence Seaway
Kings River Project
Silver Falls Hydroelectric
Trans-Canada Pipeline
Feather River
Pacific Northwest Pipeline
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**Gardner-Denver . . . the number one choice
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100
YEARS

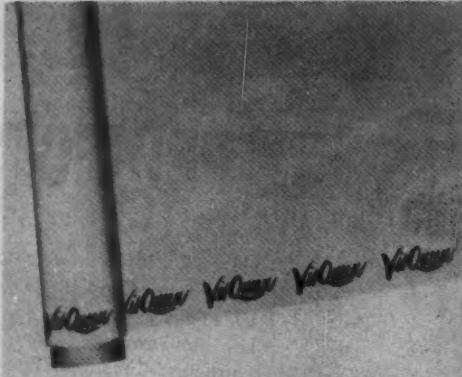
EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

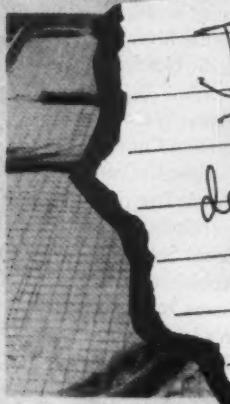
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curley Avenue, Toronto 16, Ontario

BEWARE OF IMITATIONS!



Be Sure: Look for the VISQUEEN mark on every foot of VISQUEEN film. This trademark is your assurance that you have the first and foremost polyethylene film.

Be Safe: VISQUEEN film meets Federal Housing Administration Minimum Property and Test Requirements.



Jack:
Be sure our supply house
delivers the VISQUEEN brand of
poly for the vapor barrier.
We can't afford to chance
our reputation on anything else.

B. J.

Be Ahead: ONLY VISQUEEN film offers
less widths up to 32' in
one continuous roll. That's
age. No piecing together
means greater durability and strength.

Write now.

VISQUEEN film—first and foremost polyethylene film.
A product of the long experience and outstanding research of
PLASTICS DIVISION

VISKING COMPANY Division of UNION CARBIDE Corporation.

6733 West 65th Street, Chicago 38, Ill.

In Canada: VISKING COMPANY DIVISION OF UNION CARBIDE CANADA LIMITED,
Lindsay, Ontario.

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Union Carbide Corporation.



B.F.Goodrich

B.F.Goodrich

Smileage!



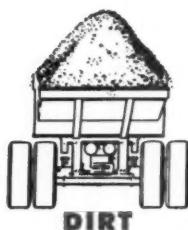
How to get more service
from off-the-road tires

Watch out for overloading

Overloading reduces tire service—puts severe, often expensive, strain on other parts of the equipment. Carrying more than the rated load increases the danger of costly tire failures and disrupted work schedules. Make sure you know the proper load limits for your vehicles, and you will avoid these

Effects of overloading

1. Overflexing—breaks down tire cord body.



With packed earth, weighing 2570 lbs. per cu. yd., these tires may not be overloaded. But with a similar load of marl clay weighing 3700 lbs. per cu. yd. tires would be overloaded.

Tires may be fully loaded with bituminous coal weighing only 1435 lbs. per cu. yd., but if other types weighing up to 2270 lbs. per cu. yd. are hauled, fewer cubic yards should be carried.

Watch volume of loads. For example, shale weighs 2800 lbs. per cu. yd. and sandstone up to 4500 lbs. per cu. yd. Looks and actual weight of loads can be deceiving.

Check tire inflation regularly

Air pressure should be checked once a day if possible, but never less than two or three times a week. Check tires when they are cool. Examine valve cores for leaks. Pressure "buildup" is normal. If pressure goes 15 lbs. over normal, reduce load or speed. Never "bleed" air pressure build-up under operating conditions, especially in hot weather.

Results of overinflation

1. Cords are stretched, lose as much as 35 to 40% of their tensile strength—too weak to resist impact breaks.
2. Rubber is under tension and susceptible to cuts.



OVERINFLATION



UNDERINFLATION



PROPER INFLATION

2. Greater impact when tire strikes an obstruction—more likelihood of cord damage.
3. Strained tire beads—resulting in complete tire failure.
4. Increased chance of cutting—rate of tread wear skyrockets.
5. Severe pounding action—causes tread and ply separation.

3. Tread ground contact area is reduced, speeding rate of wear.
4. Less contact area lessens flotation, reduces traction, requires more power.
5. Equipment is pounded to pieces, driver fatigue is increased.

Results of underinflation

1. Tires flex severely, build up excessive heat which may cause ply or tread separation.
2. Edges scuff over the road. Tread center buckles causing rapid shoulder wear.

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9 Tire Care Tips

Respect for equipment and a keen interest in keeping it in good condition are characteristics that make one driver better than another. Here

are some pointers a good driver never forgets—pointers that lead to increased tire performance and lower tire cost-per-mile or per-hour.



DON'T SPEED

Off-the-road tires are designed for speeds up to 30 mph, depending on the load carried. Excessive speed results in fast tread wear and heat build-up.



DON'T PIVOT

Pivoting on one wheel causes tire body distortion that loosens cords, damaging both tire and tube. It also tends to twist foreign objects into the tread.



DON'T JUMP LOADS

Banging tires against a barrier to speed up unloading can cause serious tire damage. Tilt the load more and gravity will handle the unloading.



DON'T SPIN WHEELS

Every turn of a wheel without traction scrapes off good rubber and wastes engine power.



DON'T DRIVE OVER OBSTACLES

Avoid sharp rocks and other objects that can damage tires and cause premature tire failure.



DON'T SLAM ON BRAKES

Quick stops scuff off tread rubber. Anticipate stops—brake gradually.



AVOID OIL

Rubber soaked in oil, gas or grease deteriorates quickly. Avoid areas where these substances are prevalent.



DON'T RUB TIRES

Side banks are just as detrimental to off-the-road tires as street curbs are to passenger car tires.



DON'T KEEP SECRETS

Report any unusual condition of tires, vehicle or road surfaces. Inspect your vehicle regularly.

Make sure you have the right

The right tires give you lowest cost per mile!

B.F.Goodrich makes a complete line of off-the-road tires—both tubeless and tube-type—in a full range of sizes and tread designs. Each tire is engineered to give longer service under certain types of operating conditions. Make sure the tires you use were designed for the work you do, because the right tires give you lowest cost per mile!

All B.F.Goodrich off-the-road tires are available with FLEX-RITE NYLON cord construction. FLEX-RITE NYLON withstands double the impact of ordinary materials, resists heat blow-outs and flex breaks. The B.F.Goodrich FLEX-RITE NYLON cord body out-wears even extra-thick treads, can be retreaded over and over.



Ribbed Logger

Running mate to the Rock Logger, this tire is designed for front-free-rolling wheels. May also be used on drive wheels where extreme traction is not needed. Sizes 9.00-20 thru 10.00-22.



Rock Service

Newest, off-the-road tire on the market today prevents unnecessary tire failures. For mine, quarry and dirt-moving work. Regular, wide base and high tread types available. Sizes 12.00-21 thru 33.5-33.



All-Purpose

Designed for truck operators who use their equipment on both smooth pavement and dirt, gravel or mud roads. Up to 67% deeper tread digs in and pulls. Sizes 6.00-16 thru 12.00-24.



There's a B.F.Goodrich tire

tires for the work you do!



Rock Logger

For logging, transit mix and dump trucks, and the like. Use it in the rough and on short highway hauls. Ribbed tread and wire overhead types too. Sizes 10-22.5 thru 14.00-24.



Super Traction

Built for traction and flotation on power wheels of dirt-moving rigs working in sand, mud and soft dirt. Use tire in reversed position on free-rolling wheels. Sizes 18.00-24 thru 27.00-33.



Earth Mover Traction

This free-rolling tire is designed for scrapers, earth-moving wagons and heavy-duty pulled equipment. Gives modified traction too. Sizes 11.00-20 thru 24.00-29.



Tractor Grader

For drive wheels on road graders, motor patrols and tractors used in construction work, grading, road maintenance. Wide base and ribbed tread available. Sizes 9.00-24 thru 18.00-26.



e for every off-the-road job!

Operating conditions

The most important factor in operating conditions is the haul road. Proper planning of the road and work areas to prevent excessive braking and turning will save valuable time and cut tire costs.



Road maintenance

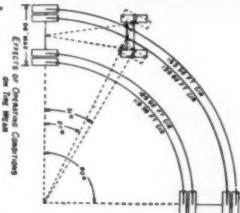
The road bed should be built and maintained free of severe depressions or chuck holes. Constant maintenance with a bulldozer or road grader will pay big dividends in reduced tire and equipment expense.

Tire clearance

Be sure tires do not rub against the body of the vehicle. Check regularly to avoid tire damage caused by loose or broken springs.

Water

Wet rubber cuts three to four times as easily as dry rubber. Eliminate water by ditching or pumping in areas where rubber-tired equipment is used.



The outside dual tire on a sharp curve travels considerably farther than the inside tire. It scrapes this extra distance.

Rely on expert on-the-job tire service to cut operating costs!

B.F.Goodrich Servicemobiles are equipped with hydraulic cranes, pneumatic wrenches, head jacks and all the latest tools for on-the-job tire service—no matter how big the tire, how intricate the equipment, how complicated the job! B.F.Goodrich Service Men give you fast, expert service. Result: you save on downtime, eliminate unnecessary delays. Reduce operating costs.



Tree stumps, boulders and other obstacles should be cleared from the haul roads and working areas.

Be sure tire clearance is satisfactory at all times. Check for loose or broken springs which might damage tires.



5 no-obligation B.F.Goodrich services

Your B.F.Goodrich Tire Service Man will:

1. Inspect all your tires.
2. Point out tires that should be repaired or replaced.
3. Select tires for re-treading by factory-tested and
4. Set up a proper inflation program.
5. Start you on a program of regular tire rotation and inspection.

proved B.F.Goodrich methods.

Call the B.F. Goodrich store or dealer nearest you for all your tire and service needs

The B.F. Goodrich stores and dealers listed below are prepared to cut your operating costs and increase tire life with expert, on-the-job tire service. For a more complete listing in your area, consult the Yellow Pages of your phone book.

stumps, boulders
other obstacles
should be cleared
the haul road
working areas.

are tire clearance
satisfactory at all
s. Check for loose
broken springs
which might damage

ALABAMA

ANNISTON	A-2571
BIRMINGHAM	F-2481
GADSDEN	L-5271
HUNTSVILLE	J-2487
MOBILE	H-2681
MONTGOMERY	A-1681
TUSCALOOSA	P-3832

ARIZONA

PHOENIX	A-3188
TUCSON	Baum & Adams

ARKANSAS

BLITZHEVILLE	P-3818
CAMDEN	T-8334
FORT SMITH	S-1124
LITTLE ROCK	F-3808
MALVERN	408
PINE BLUFF	J-5123

CALIFORNIA

BAKERSFIELD	F-4701
BELL GARDENS—Gardner Tire Sales	S-3811
EUREKA	B-6700
FRESNO	A-3218
LOS ANGELES	R-6171
MEREDITH	L-2488
OAKLAND	H-2800
REDWOOD CITY	E-4548
RICHMOND	B-7271
SACRAMENTO	G-3811
SAN BERNARDINO	T-8947
SAN DIEGO	B-3131
SAN FRANCISCO—Perry & Whittley, Inc.	Underhill 1-1800
SAN JOSE	Cypress 5-0000
SAN MATEO—Perry & Whittley, Inc.	H-2800
STOCKTON	H-8981
VAN NUYS—Ben Rudnick Tire Co.	S-3886
VISALIA	A-6719

COLORADO

DENVER	K-0175
PUEBLO	Lincoln 4-1883

CONNECTICUT

HARTFORD	J-2121
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DISTRICT OF COLUMBIA

WASHINGTON	R-4825
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FLORIDA

DAYTONA BEACH	C-6505
FT. LAUDERDALE	J-4902
JACKSONVILLE	E-1517
LAKELAND	M-6231
MIAMI	N-3635
OCALA	M-4254
ORLANDO	G-2161
PENSACOLA	H-3181
ST. PETERSBURG	7-1197
TAMPA	B-8181
WEST PALM BEACH	T-4181
WINTER HAVEN	C-3832

GEORGIA	
ALBANY	H-Emlock 2-8491
ATLANTA—Edgewood-Warren Tire Co.	Murray 8-6447
ATLANTA	J-Ackson 2-5036
AUGUSTA—Brown Bros. Hardware Co., Inc.	C-5581
COLUMBUS	Fairfax 2-3581
DALTON	B-Roadway 8-2223
MACON	Sherwood 3-4458
ROME	3-2948
SAVANNAH	Adams 8-0831

MARYLAND	
BALTIMORE	E-Belmont 8-9554
CUMBERLAND	Parkview 2-3177
HAGERSTOWN	Regent 8-4798

MASSACHUSETTS	
BOSTON—Merchants Distributors, Inc.	CO 7-8900
BROCKTON	JU 3-0100
NORTH CAMBRIDGE	UM 4-4894
SPRINGFIELD	RE 3-6888

MICHIGAN	
DEARBORN	LUtzen 1-0900
DETROIT	F-Orest 6-4922
ESCANABA	STate 6-7783
FARIBOROUGH	GRand Rapids 8-3444
GRAND RAPIDS	S-Tate 8-6136
JACKSON	Firestone 3-2544
KALAMAZOO	J-Vanho 2-0621
LANSING	PONTIAC 6-1212
PONTIAC	PLeasant 2-4101
SAGINAW	Midway 5-3881

MINNESOTA	
DULUTH	RAndolph 8-0717
MINNEAPOLIS	F-Eddies 5-1189
ST. PAUL	Capitol 3-3817
ST. PAUL	Midway 6-3112

MISSISSIPPI	
BILOXI	FEldwood 8-8151
COLUMBUS	Fairfax 8-7150
GREENWOOD	70
HATTIESBURG	UNiversity 4-2474
JACKSON	Fleetwood 6-1512
LAUREL	4275
MERIDIAN	2-3129
NATCHEZ	2-1661
PASCAGOULA	South 2-2555
VICKSBURG	M3
YAZOO CITY	2164

MISSOURI	
HANNIBAL	137 & 138
JOPLIN	M-Ayfair 4-4141
KANSAS CITY	V-Alentine 1-4777
MEXICO	J-Ustice 1-3040
POPLAR BLUFF—J. A. Parker Tire Co.	S-Utmost 5-3928
ST. CHARLES	RAndolph 4-3646
ST. LOUIS	F-Orest 7-9298
SPRINGFIELD	UNiversity 4-2581

NEBRASKA	
LINCOLN	Market 0-4887
OMAHA	M-Akron 0-4880
OMAHA	J-Ackson 4054

NEVADA	
WELLS—A Way Service	SKylane 2-3734

NEW JERSEY	
BRIDGETON	8-7191
CAMDEN	W-Oakland 4-3191
ELIZABETH	Elizabeth 2-4088

NEW MEXICO	
ALBUQUERQUE	Chappel 2-5887

TEXAS	
HOUSTON	8-3888
KILLEEN	REpublic 2-4294
LAWRENCEVILLE	F-Orest 6-4371
LUFKIN	C-Enter 4-3398
MARSHALL	H-Emlock 8-0647
MARSHFIELD	F-Airfax 3-0388
MARSHWOOD	J-Ackson 2-0191
MARSHWOOD	3-0174

MORE

Expert B.F.Goodrich on-the-job service is as close as your phone

NEW YORK	ALTOONA	WINDSOR	OUTFIELD
ALBANY	ALBANY 4-8115	WINTER 4-9345	OAKFIELD 5-8378
BUFFALO	GRIANT 4643	UNIVERSITY 7-4104	OAKFIELD 3-0330
EDEN—Vic Schrader Tire Service	EMERSON 9666	4-3310	Capitol 7-0141
NEW YORK	JULIUS 2-1639	2-2005	POTTER 5-7786
HIGHWOOD FALLS	BUTLER 2-1639	4-7727	MARSHALL 5-7726
OLEAN	GREENSBURG 2-1253	CEDAR 4-4468	WEATHER 5-4477
POUGHKEE	GLOBE 2-4600	HAZELTON—Schultz's 4-9801	MURRAY 5-3354
ROCHESTER	GLEWOOD 3-3635	JOHNSTOWN—McNally Tire & Rubber 7-9343	FEDERAL 5-3378
SYRACUSE	GRANTS 6-8716	LANCASTER	TUXEDO 5-3221
UTICA	REDWOOD 3-7335	PHILADELPHIA	GREENWOOD 2-3631
		PIERSBURGH	YUKON 5-8887
		MUSEUM 2-8310	CAPITAL 5-2278
		PROVIDENCE	LYRIC 5-8800
		READING	HILLTOP 5-3341
		TURTLE CREEK	WESLACO 5-2822
		WASHINGTON	WICHITA FALLS 322-1122
		WILKES-BARRE—Economy Gas & Oil Co. VALLEY 3-0180	
		YORK—L. J. Allen Co. 5728	
NORTH CAROLINA	RHODE ISLAND	VERMONT	
ASHEVILLE	Alpine 3-2728	PROVIDENCE	UNIVERSITY 2-3801
CHARLOTTE	EDISON 3-4133		
GREENSBORO	ROADWAY 2-3197		
RALEIGH	TEMPLE 3-3831		
WINSTON-SALEM	PARK 2-4119		
NORTH DAKOTA	PROVIDENCE	BURLINGTON	
FARGO	ADAMS 2-8781	DE 1-9800	
OHIO	SOUTH CAROLINA	VIRGINIA	
CINCINNATI	CHERRY 1-4860	FRONT ROYAL—Board Tire & Battery Co.	277
CLEVELAND	PROSPECT 1-3630	HARRISONBURG	4-4465
COLUMBUS	CAPISTOL 1-0661	NEWPORT NEWS	6-1329
DAYTON	BALDWIN 3-0181	AMHERST 7-1176	MAHOGANY 5-3337
ELVRIA	FAXFAX 2-3711	CHATTANOOGA	EXPERT 7-2277
MANSFIELD	ALAYETTE 4-5141	CLEVELAND	ELGIN 5-3286
MARIETTA	FLANDER 3-2068	DYERSBURG	4-3041
STRONGSVILLE	FRANCIS 3-2068	JACKSON	ST. PAUL—Tri-County Tire Service
TOLEDO	CHERRY 3-1298	KINGSPORT	RO 5-3301
WOOSTER—Stevens Tire Company	HOWARD 2-8900	KNOXVILLE—Timley Tire Co.	WINCHESTER
		MORRISTOWN	
		NASHVILLE	
OKLAHOMA	TEXAS	WASHINGTON	
ENID	ADAMS 4-8121	ABILENE—Allison Truck Terminal	
OKLAHOMA CITY	FOREST 6-1947	OFFICED 4-2723	DA 5-4133
OKLAHOMA CITY—Johnson's Tire Co., Ltd.	JACKSON 6-4464	MICHIGAN 4-2111	DICKENS 5-4831
TULSA	LUTHER 5-1221	DRIVE 4-5221	MAIN 5-3664
TULSA—Tom P. McDermott	Diamond 3-0188	ALEX	MAIN 4-5271
		AMARILLO	SPokane 5-8301
OREGON	OREGON	TACOMA	MAIN 7-9173
EUGENE	Diamond 6-6141	CHARLESTON	
PORLAND	BELEMONT 6-2106	CLARKSBURG	
PORLAND—Mel Goodrich Recap Plant	ATLANTIC 6-5841	MORGANTOWN—Bob Dimmire Tire Service	5188
SALEM—Russell's Tire Service	EMPIRE 2-8801	PARKERSBURG	GARFIELD 5-4079
		WHEELING	CELESTE 5-4880
PENNSYLVANIA	TEXAS	WEST VIRGINIA	
ALLENTOWN	HEMLOCK 3-3948	ABILENE—Bluefield Ret. & Vol.	
		CHARLESTON	DA 5-4133
		CLARKSBURG	DICKENS 5-4831
		MORGANTOWN—Bob Dimmire Tire Service	MAIN 5-7081
		PARKERSBURG	MAIN 5-4079
		WHEELING	DA 5-4133
PULL TO TEAR OUT		WISCONSIN	
		LA CROSSE	4-5885
		MADISON	ALPINE 5-8882
		MILWAUKEE	DIVISION 4-2180

Enter the B.F.Goodrich Truck Tire Mileage Contest. You can win a Thunderbird, or Corvette, or one of 310 other prizes. See your B.F.Goodrich dealer today for entry blanks.

Specify B.F.Goodrich tubeless or tube-type tires when ordering new equipment.

B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.

B.F.Goodrich *truck tires*

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DIGS and DUMPS *in a Hurry*



PULL
TO
TEAR
OUT

- UNIT in a gravel pit is always "in there swinging" . . . piling up big payloads . . . earning PROFITS!

The machine cuts away for a healthy load, swings and dumps in a hurry.

Owners like the ease of operation and the FULL VISION CAB for complete visibility.

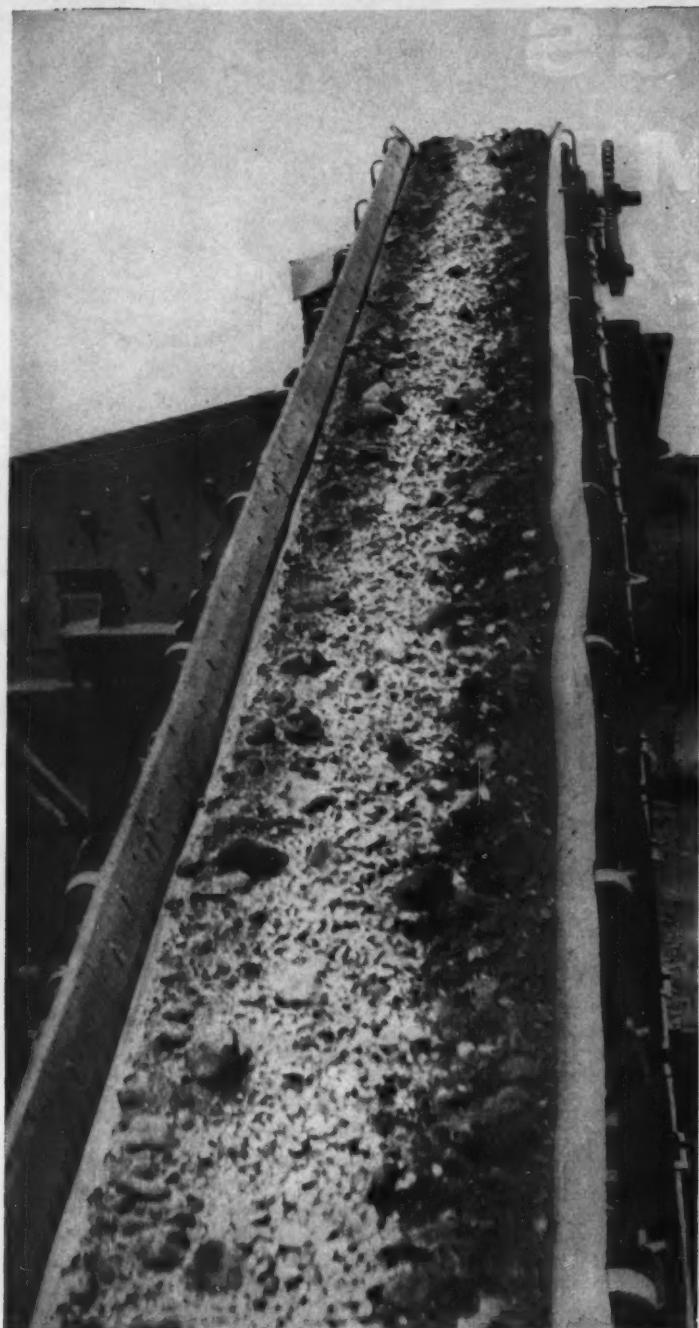
They also like the sturdy construction, economical performance and low upkeep which all add up to earning power. Why not investigate what UNIT can do for you — on your next excavating and material handling job? Write for literature.

UNIT CRANE and SHOVEL CORP.

6305 W. Burnham St., Milwaukee 19, Wisconsin, U.S.A.



AGGREGATE HANDLING BELTS



24" conveyor belt carrying rock from crusher rolls.

"Only 'U.S.' Belts hold up in handling crushed rock,"

says vice president of plant

"We use hundreds of feet of 'U.S.' Belting", says G. H. Lindekugel, Jr. of G. H. Lindekugel & Sons, Mitchell, So. Dakota. "Performance is extremely good. Our operation consists of highway construction and pit deposits. We average 600 tons per hour at our crushing plant. U. S. Rubber Belts work 12 hours a day, 6 days a week, carrying rock and gravel. We have no complaints. *Couldn't find any other belts that could handle crushed rock for any length of time.* 'U. S.' belts have been three years on the job, are in good condition".*

It's performance such as this that has made U. S. Rubber the largest manufacturer of belts.

• • •
When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

*This installation was handled by "U. S." Distributor W. S. Nott, Minneapolis.



Mechanical Goods Division

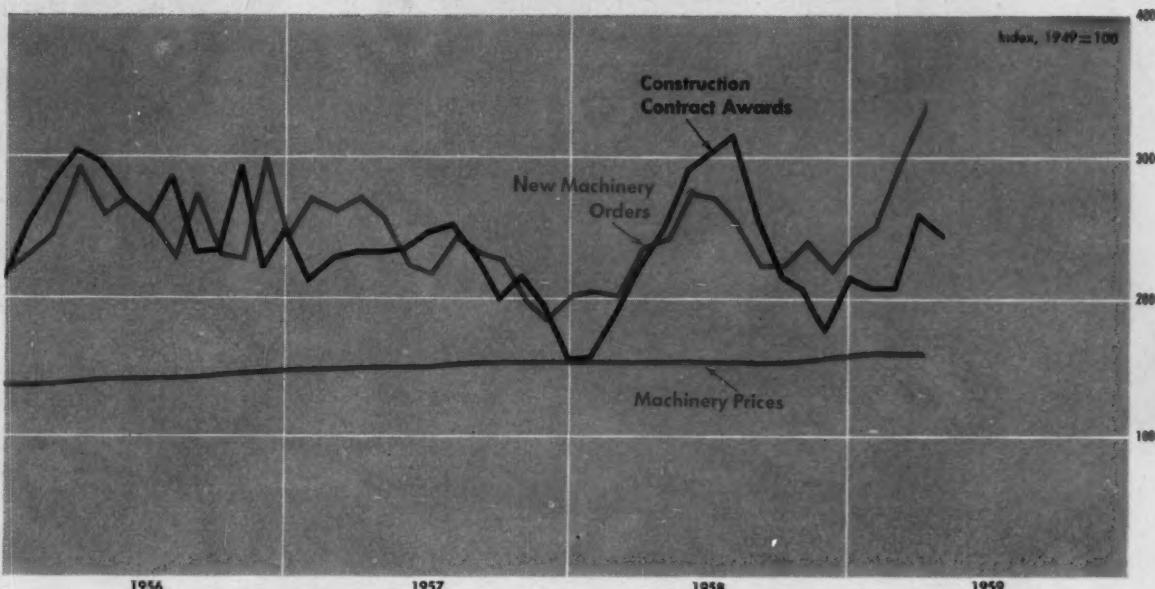
United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

In Canada: Dominion Rubber Company, Ltd.

Trends in the Machinery Market



Price Index

	MAR 1959	MONTH AGO	YEAR AGO	% CHANGE 1958-1959
All Types of Equipment	171.6	171.4*	165.5	+ 3.7
Cranes; Draglines, Shovels	188.7	188.7*	183.1	+ 3.4
Shovel, ½ cu yd	156.2	156.2	153.7	+ 1.6
Shovel, ¾ cu yd	173.3	173.3	167.4	+ 3.5
Shovel, 1-½ cu yd	184.6	184.6*	175.8	+ 5.0
Shovel, 2-½ cu yd	159.5	159.5*	153.9	+ 3.6
Shovel, 3-½ cu yd	167.8	167.8*	162.7	+ 3.1
Shovel, 6 cu yd	188.2	188.2*	179.5	+ 4.8
Crane, truck mounted	169.4	169.4	164.2	+ 3.2
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	157.5	157.5	152.7	+ 3.1
Bucket, dragline	169.3	169.3*	180.8	- 6.4
Scrapers and Graders	163.8	163.8	158.8	+ 3.1
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	156.8	156.8	151.3	+ 3.6
Scraper, 2 Wheel, 14-18 cu yd (a)	123.7	123.7	122.7	0
Grader, heavy duty	171.1	171.1	164.0	+ 4.3
Grader, light & medium	166.1	166.1	161.2	+ 3.0
Tractors (non-farm, Incl Industrial)	187.8	187.8	180.5	+ 4.0
Wheel-type, off highway (a)	128.2	128.2	128.4	- 0.2
Crawler-type, 45-60 hp	191.9	191.9	182.6	+ 5.1
60-80 hp	196.4	196.4	185.8	+ 5.7
80-120 hp	191.3	191.3	196.7	- 2.5
120 and up hp	201.3	201.3	191.8	+ 5.0
Machinery, Tractor Mounted	188.6	188.6	181.7	+ 4.3
Dozer, cable controlled	154.4	154.4	151.6	+ 1.9
Dozer, hydraulic controlled	186.6	186.6	177.3	+ 5.3
Cable power control unit	151.4	151.4	147.9	+ 2.4
Loader, shovel type	161.5	161.5	153.9	+ 4.9
Specialized Machinery	153.5	153.3*	150.7	+ 1.9
Ditcher	156.6	156.6	154.1	+ 1.6
Roller, tandem	198.6	198.6	193.2	+ 2.8
Roller, 3 wheel	170.2	170.2	161.6	+ 5.3
Ripper and roto	150.5	150.5	143.3	+ 5.0
Dewatering pump, 10 M gph	110.0	110.6*	111.7	- 1.5
Dewatering pump, 90 M gph	148.3	148.3*	144.3	+ 2.8
Portable Air Compressors	166.0	159.5	159.1	+ 4.3
Contractor's Air Tools	181.8	181.6	164.6	+ 10.3
Mixers, Pavers, Spreaders	155.8	155.8*	149.2	+ 4.4
Mixer, portable, 11 cu ft	164.1	164.1	160.1	+ 2.5
Mixer, portable, 16 cu ft	168.6	168.6	163.7	+ 3.0
Mixer, truck, 6 cu yd	131.1	131.1	128.1	+ 2.3
Mixer, paving, 34 cu ft	191.6	191.6*	185.2	+ 3.5
Concrete finisher & spreader	191.5	191.5	173.0	+ 10.7
Bituminous distributor	122.3	122.3	122.4	- 0.1
Bituminous spreader	170.2	170.2	160.3*	+ 6.2
Bituminous paver	162.6	162.6*	153.0	+ 6.3
Off-Highway Trucks, Wagons (b)	101.1	101.1	100.0	+ 1.1
Contractors off-highway truck (b)	101.1	101.1	100.0	+ 1.1
Trailer dump wagon (b)	101.4	101.4	100.0	+ 1.4

* a January, 1955=100 * b January, 1958=100 * Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49=100

Equipment Orders Hit Record Peak

The fast pace of heavy construction contracts is creating a record demand for new equipment. March orders for construction and mining machines soared to an all-time high, according to manufacturers reporting their volume to the McGraw-Hill Department of Economics.

The New Orders Index in March climbed for the fourth consecutive month to 339, based on 1949=100. This is 14% above February and a 46% jump over March, 1958.

For the first three months of this year, equipment orders are running 40% over their dollar volume in the same period of last year. The New Orders Index has averaged 297 per month compared with the monthly average of 286 that manufacturers predicted for the year as a whole (*Construction Methods*, April, p. 41).

Heavy construction contracts reported by *Construction Methods* through the end of March were 20% above 1958. Awards scored the second largest March total on record with a Contract Award Index of 262. However, the margin of increase over last year was cut to 10% by the end of April. The rate of awards slackened a bit last month to a contract index value of 243. This still is the third highest total on record for the month of April.

Highway construction contracts are off to a slow start this year; the four-months total is down 1% under last year. But state highway departments are planning a 10% increase in lettings this year, and that points to a spurt in awards during the next few months. The second six months of this year should outshine the last half of 1958.



"Our Ford F-800's, pulling 20-ton payloads, give us mighty good service!"

*says R. Dillard Teer, Vice President
Nello L. Teer Co., Durham, N. Carolina*

"We operate about 115 Ford Trucks ranging in size from $\frac{1}{2}$ -ton pickups to Tilt Cab Tandem tractors. We believe in carefully fitting the truck to the job to be done and usually stay within the manufacturer's recommended ratings. We make an exception to this rule with our Ford F-800's, pulling 20-ton loads in aluminum trailer dumps to our quarry and crushing setup at Durham, North Carolina. These units are carrying the maximum legal limit and give us mighty good service!

"We haven't traded any trucks in about 6 years. It just happens that our company has

been growing so rapidly that when we buy a new truck, usually an F-800, I put it under one of our trailer dumps. Then I'll take the old truck, lengthen the chassis, and make a grease outfit or a water wagon out of it. I would say out of over a hundred Ford units in the past 7 or 8 years, we have gotten rid of only a dozen altogether—and some of these were wrecked or burned.

"Another reason we use Fords is that this business is rough on trucks, so parts availability is very important. Our experience over the years with Ford as compared to Ford competitors has been definitely in favor of Ford on parts."

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Now



NOW! CERTIFIED PROOF!

FORD TRUCKS COST LESS

**'59 Ford Pickups
beat average mile-
age of other leading
makes by 25.2% in
Economy Showdown U.S.A.**

Here at last is certified proof of the differences in gas mileage between six-cylinder pickups . . . evidence that you can use in your operation.

It was compiled by America's foremost independent automotive research firm after testing 1959 six-cylinder,

ton pickups of the six leading makes. All trucks were bought from dealers—just as you would.

The tests paralleled every kind of driving — high speeds and low, open highways and city traffic, even door-to-door delivery. And in every test, '59 Ford Sixes delivered more miles per gallon than any other make. Here are the actual percentages:

- '59 FORD PICKUP SIXES GAVE**
- 42.6% better mileage than make "D"**
- 31.1% better mileage than make "I"**
- 25.2% better mileage than make "C"**
- 22.0% better mileage than make "S"**
- 9.6% better mileage than make "G"**

Taken together, Ford got 25.2% more miles per gallon than the average of all other leading pickups!

Now! During Dividend Days at your Ford Dealer's... Go FORD-ward for Savings

What's the secret of Ford's economy? First, of all pickup sixes, only the Ford Six has modern Short Stroke design which reduces friction and requires less fuel. Second, to this modern engine, Ford has added a new economy carburetor to meter fuel more precisely in both high- and low-speed ranges.

See your Ford Dealer for the full report of Economy Showdown U.S.A. and get the whole story firsthand.

All tests
conducted and results

CERTIFIED

by America's foremost
independent automotive
research organization*

*NAME AVAILABLE ON REQUEST
Send inquiry to P.O. Box 2687, Ford Division
Ford Motor Co., Detroit 31, Michigan

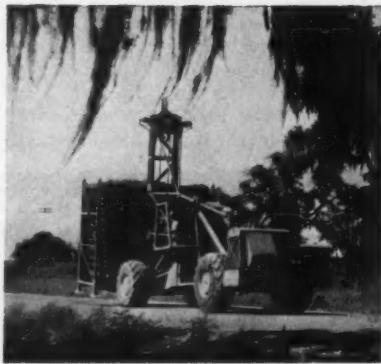


FREIGHT MOVES ACROSS
DEEP ARCTIC SNOW
ON ELECTRIC WHEEL
"SNO-TRAIN"

BY R. G. LeTOURNEAU, INC.

Heavy cargo . . . powdery snow . . . hundreds of miles from solid ground — these are conditions conquered by the Army's "Sno-train," built by R. G. LeTourneau, Inc.

Electric Wheels . . . sixteen or sixty and each prime mover . . . make hauling possible where other cargo vehicle has ever penetrated. "Floated" on huge, low-pressure tires — ten feet high by four feet wide — the Electric Wheels provide



STACKER lifts . . . carries . . . stacks 30-ton loads. Electric Wheels give infinite range of power control from dead stop to full speed for smooth, fast traveling, and tremendous torque for muddy yards.



TRANSPORTER traverses Pakistan desert with oilfield equipment. Regenerative electric braking automatically holds machine and 30-ton load at pre-set speed . . . has no friction surfaces or wearing parts.



LANDING CRAFT RETRIEVER frees stranded in surf. Electric Wheels and foot tires assure tremendous traction and flotation needed to operate thru water. Simple fingertip controls are el-

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Electric Wheels Work as a Team To Out-Perform Other Drive Systems



For the last five years, the Electric Wheel developed by R. G. LeTourneau, Inc., has been used to power many types of machines . . . some of them built for jobs never before considered feasible. Where conventional machines have failed, the tremendous power of numerous driving wheels . . . four, forty or even more . . . has provided the cumulative traction needed to carry heavy loads cross-country.

This capability has been successfully applied in mobile machines for industry wherever tremendous tractive power is required. It is now available for hauling, digging, pushing and other BIG construction jobs. Because the Electric Wheel is its own self-contained power package, design is not limited by power-transmission systems. These wheels are *prime movers*, for use wherever and in whatever numbers needed, whether a four-wheel tractor, a six-wheel scraper or a fifty-wheel ore train.

NOW IN EARTHMOVING

Earthmoving machines with all-wheel electric drive — one of them shown below — are now being built for the BIG jobs in construction and mining. For information please call or write 2395 South MacArthur, Longview, Texas.



R.G. LETOURNEAU INC
LONGVIEW, TEXAS

E-104

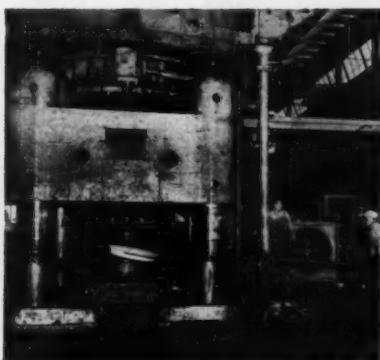
tremendous traction needed to move big, heavy payloads cross-country.

Automatic sharing of power to wheels with best traction . . . simple electric controls . . . electric braking . . . are other features that make this and other overland trains built by R. G. LeTourneau, Inc., forerunners of a new era in overland transportation.

Have your men consider this system of transportation when planning your next BIG mining or construction job.



CRANE for Navy carriers handles plane dispersal and quickly clears deck of crashed planes. All work functions powered by electric motors which give "inching" control, positive safety.



FORGING PRESS shapes part for Electric Drive machine in one of our plants. All components that go into equipment are built by R. G. LeTourneau, Inc., to assure dependable, trouble-free performance.



NEW EARTHMOVING EQUIPMENT. L-28-Ton Digging Scraper is latest of new Electric Drive earthmoving equipment now working. Write for information on exciting new machines for your BIG jobs.

Construction Business . . .

States Plan Record Road Work

CONTRACTING PLANS of state highway departments and toll-road agencies are bigger than ever this year. Contractors may sign up a record \$5.3 billion in highway and bridge contracts, including county and municipal roads.

State highway departments in 46 states and the District of Columbia are budgeting a 10% increase—a total of \$4.7 billion—in awards this year. Lettings by Connecticut and Arkansas, which did not report their plans to CM&E, may bring this total to \$4.8 billion.

In addition, tollroad bridge agencies expect to award \$87 million in contracts this year, a 13% increase over last year. And contracts for county and city roads should add some \$500 million, about the same as in 1958.

Alaska, Hawaii, and Puerto Rico add \$71 million to the 1959 highway and bridge construction market.

Thirty-six states and the District of Columbia plan to let more work this year than last; only 10 states intend to cut back from 1958. Among these planning reduction are the major roadbuilding states of New York, Ohio, and Pennsylvania where decreases range from 12% to 26%.

Though total tollroad and tollbridge contracting plans add up to more than last year's lettings, most toll agencies are going to cut back construction contracts. However, substantial increases are budgeted by the Washington Toll Bridge Authority, the Pennsylvania Turnpike Authority and the Port of New York Authority.

All states don't expect to have clear sailing when they carry out their highway contracting plans for 1959. Several highway departments anticipate problems in acquiring needed right-of-way and in finding sufficient state funds to match available federal-aid funds. Some highway departments also are concerned about the possibility of a steel strike on July 1. A strike of a month or more could upset contracting schedules, particularly for bridge construction.

Most states plan to cut back contracts for "ABC" federal-aid projects. That's because they won't be allotted this year the \$400 million extra in federal "D" funds that Congress appropriated last year. In addition, some states have received smaller apportionments of federal funds for interstate roads this year than last because of the change in the formula used by the Bureau of Public Roads to apportion money to the states. The smaller amount of federal funds available for fiscal 1960 will force states which were using up their allotments on schedule to trim 1959 contracts.

For example, New York cites both the absence of special "D" funds and a smaller apportionment of federal interstate funds as reasons for a 12% decrease in its 1959 contracting plans. Its interstate allocation for fiscal 1959 was \$156.1 million; the 1960 figure is \$123.2 million.

Colorado plans a 25% reduction in 1959 awards because of a lower apportionment of federal funds (\$19.3 million for interstate vs \$30 million last year).

Right-of-way difficulties are possible stumbling blocks in Arizona, Colorado, Idaho, Indiana, Nebraska, New Mexico, Washington, West Virginia, and Wisconsin.

Bids Below Estimates

The decline in highway contractors' bid prices in the past 12 months (Construction Methods, April, 1958, p. 49) has pulled contract cost below engineering estimates in several states. These savings permit the states to buy more highway and bridge construction with the money they have available.

Colorado, for instance, figures it saved \$380,000 on 20 projects let earlier this year. Of these, 14 received low bids under the engineering estimate; only six were over. Keen competition among contractors is evidenced by an average of 9.7 bidders on each of these projects.

In Washington, bid prices are running 5% under estimates this year; and South Dakota reports low bids are averaging 14% under estimates.

continued on page 52

TOLL ROAD CONTRACTING PLANS

Reported to CM&E in thousands of dollars

Connecticut:

State Highway Department	125	2,106	- 94
Greater Hartford Bridge Auth.	200	1,600	- 87
Florida St. Turnpike Auth.	350	0
Illinois St. Toll Hwy. Comm.	600	8,000	- 92
Indiana Toll Road Commission	452	473	- 4
Kansas Turnpike Authority	114	6,802	- 98
Maine Turnpike Authority	330	420	- 21
Maryland State Road Comm.	0	542	-100
Massachusetts Turnpike Auth.	40	173	- 77
New Jersey Turnpike Authority	1,500	3,100	- 52
New Jersey Highway Authority	2,000a	2,772	- 28
New York:			
Thruway Authority	21,877b	22,500
Port of New York Authority	35,000	22,990	+ 52
Ohio Turnpike Commission	20	609	- 97
Pennsylvania Turnpike Comm.	1,315	434	+203
Texas Turnpike Auth.	30	86	- 65
Washington Toll Bridge Auth.	22,731	4,353	+422
W. Virginia Turnpike Comm.	25	0
TOTAL TOLL ROADS AND BRIDGES	86,709	76,959	+ 13

* a Anticipated but not yet approved. * b Includes 1960

5 Lorains pay off for J. & S. Construction Company



Working on a \$1,700,000 sewer job ...

3/4-YARD LORAIN-26 HELPS COMPLETE UP TO 600 FEET OF PIPE DAILY

Over 24 miles of 8-inch to 30-inch pipe, plus 10,000 feet of 4-inch laterals, will be installed by J. & S. Construction Company, Inc. of Eatontown, N.J. Their Lorain-26 helps dig trenches ranging from 6 to 26 feet deep, 3 to 4 feet wide. The L-26 lines the bottom with stone, lowers pipe into the trench and backfills. Average production ranges from 200 to 600 feet of pipe each 9-hour day, depending on pipe size.

"Joy-Stick control boosts production up to 5% over manual control," reports Albert Payakovich, operator of all types of equipment for 12 years. "With two-lever, 'Joy-Stick' control, I do as much work during the last few hours as I did at the start of the day."

Get this Lorain-26 performance. Whether you buy it as a shovel, dragline, clamshell, hoe or crane you select the "package" best suited for your needs. You'll get more for your money. See your Lorain distributor for a quotation.

THE THEW SHOVEL COMPANY, LORAIN, OHIO



"This Lorain loads 6-yard trucks in 2 to 3 minutes." So reports J. Sprague, owner. "Ever since I started in business 15 years ago I've been using Lorains. They are fast machines, economical to run, need little maintenance. They're good for our type of work."

LORAIN® ON THE MOVE

Ask your nearby Lorain distributor for the full story—and about his on-the-spot parts and service facilities that add so much when you buy Lorain.

How Standard Oil serves a contractor

Case example:

What happened when
Isabella Construction
got U.S. Highway 41 paving
job near Milwaukee



This is next. Louis Isabella explains job details to Standard's Jerry Bushman. Isabella's contract covered concrete paving of 26 miles of 24 ft. single lane highway plus interchange connections. When complete, Highway 41 in Wisconsin will be a divided lane freeway.

When N. M. Isabella, Inc. set out to put down 26 miles of pavement on U.S. Highway 41, they met Standard Oil's Jerry Bushman, an experienced automotive lubrication specialist. Jerry was ready right then to provide technical assistance on the job.

The contractor next learned about Standard Oil service when two Standard agents went into action. One agent, they found, was based at Slinger, only three miles away. Another agent was located at Allenton, only five miles from the part of 41 to be paved. These agents set up delivery schedules to the job, and meanwhile, Jerry Bushman arranged for fuel storage and pumping equipment.

Isabella put down 363,000 square yards of paving, averaging 1,600 feet of production daily. They got the job done because they were backed by the kind of service they, and their subcontractors, received from Standard.

Standard has 3,900 agents in the 15 Midwest and Rocky Mountain states ready to serve contractors in the same way these two agents served Isabella. Lubrication technical service comes from qualified, trained men located in Standard's 48 district offices. Get this kind of help on your job. Call the Standard office nearby or write to **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**

**Standard Oil Petroleum Products
used by N. M. Isabella, Inc.**
STANOLUBE S-1 Motor Oil
STANDARD RED CROWN Gasoline
STANOLEX Diesel Fuel
AMOCO Lithium Multi-Purpose Grease

You expect more from  and you get it!

Standard's Jerry Bushman and
Don Isabella wind up some lubri-
cation details. Jerry knows
the score when it comes to lu-
brication of construction equip-
ment. He has a science degree
from Marquette plus more than
four years' experience in this
sort of work. He has also com-
pleted the Standard Oil Sales
Engineering School course.

CONSTRUCTION BUSINESS... continued from page 48

But the trend is different in other areas. Indiana, Kansas, and Puerto Rico report bid prices are

about the same as engineering estimates. Pennsylvania says bids are running 13% above estimates

HIGHWAY & BRIDGE CONTRACTING PLANS — 1959

Reported to Construction Methods in thousands of dollars.

STATE HIGHWAY DEPARTMENTS	TOTAL CONTRACTS			STATE HIGHWAY DEPARTMENTS	TOTAL CONTRACTS		
	Scheduled 1958	Lst	Percent Change		Scheduled 1959	Lst	Percent Change
Maine	\$32,400	\$35,600	+ 9	Minnesota	122,000	98,303	+ 24
New Hampshire	32,400	28,900	- 12	Iowa	119,000	111,300	+ 7
Vermont	26,300	18,792	+ 40	Missouri	96,000	99,165	- 3
Massachusetts	140,200	128,187	+ 9	Arkansas	n.a.	(33,633)	c
Rhode Island	14,445	17,816	- 19	North Dakota	49,200	40,248	+ 22
Connecticut	n.a.	(50,400)	c	South Dakota	54,530	38,403	+ 42
NEW ENGLAND	248,748	229,295	+ 7	Nebraska	46,000	40,656	+ 13
New York	266,200a	302,265	- 12	Kansas	80,000	78,160	+ 2
New Jersey	111,595b	39,645c	+ 182	Oklahoma	45,000	91,995	- 51
Pennsylvania	200,000d	240,235	+ 17	Texas	300,000	292,700	+ 2
Maryland	63,500	53,000	+ 20	Montana	76,431	36,037	+ 112
District of Columbia	63,550	20,122	+ 216	Wyoming	40,800	35,356	+ 15
Delaware	16,000	10,000	+ 60	Colorado	40,400	53,200	+ 24
MIDDLE ATLANTIC	720,845	865,287	+ 8	New Mexico	40,000	39,400	+ 2
Virginia	114,004	70,953	+ 61	WEST OF THE MISSISSIPPI	1,100,361	1,054,923	+ 5
West Virginia	67,700	58,001	+ 16	Idaho	30,000	29,000	+ 3
North Carolina	65,000	63,000	+ 3	Utah	45,500	32,000	+ 41
South Carolina	82,500	86,400	- 5	Arizona	40,000	32,836	+ 22
Georgia	140,700	97,405	+ 44	Nevada	32,000	18,293	+ 75
Florida	152,000	110,200	+ 38	Washington	78,500	67,275	+ 17
Alabama	88,000	69,946	+ 26	Oregon	57,420	60,368	- 5
Mississippi	61,750	46,222	+ 34	CALIFORNIA	300,000	250,910	+ 20
Louisiana	125,000	123,000	+ 2	FAR WEST	582,920	490,682	+ 19
Kentucky	105,000	110,800	- 5	UNITED STATES*	\$4,693,301	\$4,225,998	+ 10
Tennessee	124,800	93,594	+ 33	Alaska	14,000	11,000	+ 27
SOUTH	1,225,754	829,322	+ 21	Hawaii	23,269	10,254	+ 127
Ohio	208,000	280,642	- 26	Puerto Rico	33,500	17,600	+ 90
Indiana	116,675	103,665	+ 13	*	• 46 States and District of Columbia.		
Illinois	260,000	240,000	+ 8	• a Fiscal year ending March 1960 • b Estimated			
Wisconsin	100,000	95,000	+ 5	• c US Bureau of Public Roads figure • d Estimated			
Michigan	224,000	167,000	+ 34	mated on assumption that gas tax is increased			
MIDDLE WEST	906,575	886,307	+ 3	one cent per gal. • e n.a. Net available.			

* 46 States and District of Columbia.
• a Fiscal year ending March 1960 • b Estimated
• c US Bureau of Public Roads figure • d Estimated
mated on assumption that gas tax is increased
one cent per gal. • e n.a. Net available.

so far this year, as against 6% higher in 1958.

Contractors' bid prices on federal-aid highways in the U. S. as a whole dipped in the first quarter of this year. The Bureau of Public Roads Composite Mile Price Index moved down 0.6% in the first quarter to 140.8, based on 1946 prices as 100. This is only a shade above the first quarter of last year when competition for highway jobs was the keenest it has been for years. Moreover, the latest value of the BPR index is nearly 2% under the record high reached late in 1957.

Individual state trends can vary widely from the movement in the BPR index. Four western states report first quarter highway bid prices moving counter to the BPR trend. Increases range from 3.4% to 20.3% above the fourth quarter of 1958, according to quarterly indexes computed by state highway departments in Colorado, Idaho, Nevada, and South Dakota.

Contracts Awarded on page 56

THIS JOB 6 MONTHS AHEAD OF SCHEDULE



JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment, Wellpoint
and Pumping Systems Dewatering Planning—Equipment—Service

8221 Atlantic Avenue • Bell, California

Tacoma

Minneapolis

Omaha

Tulsa

Mobile

St. Petersburg

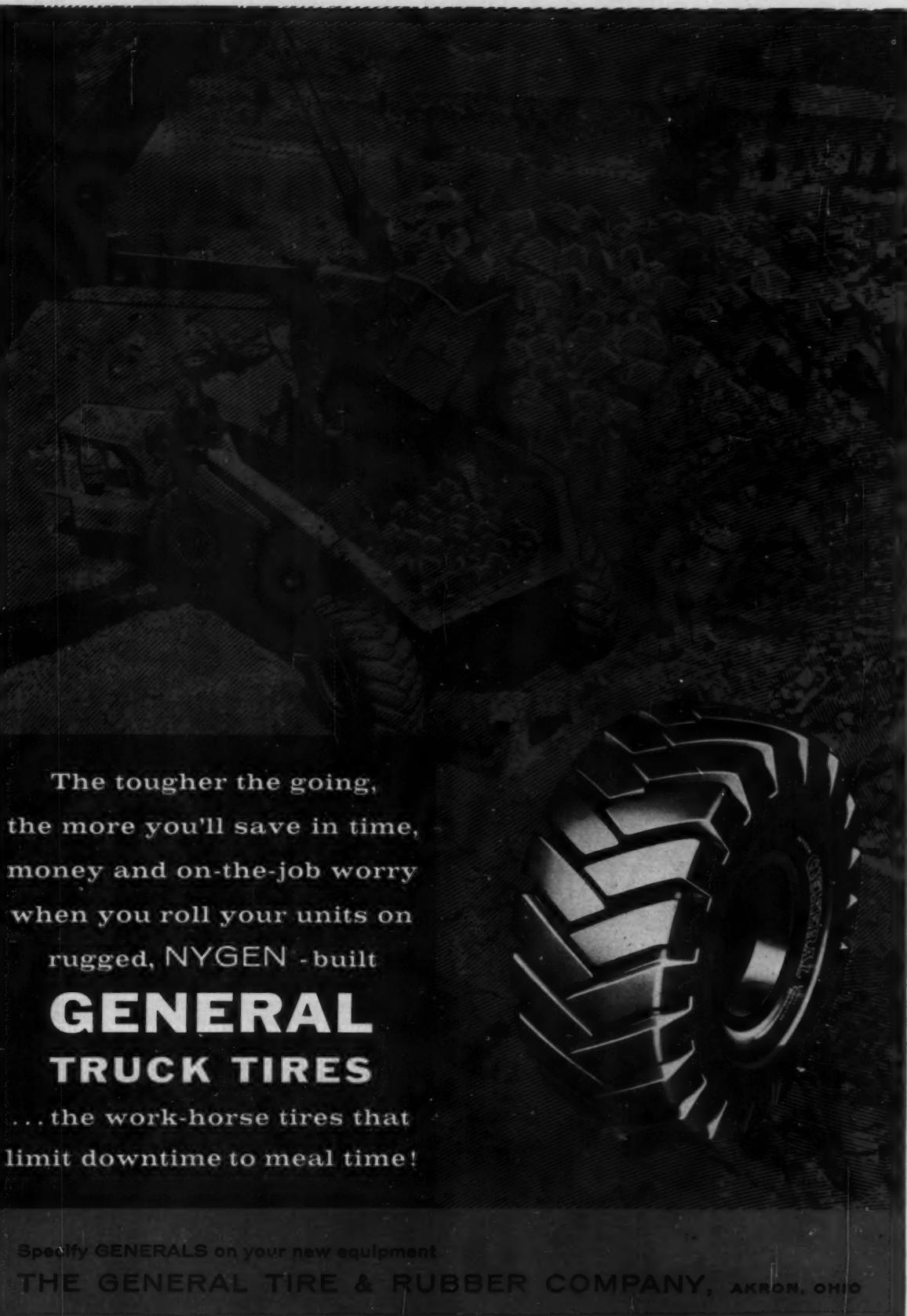
Stang dewatering cuts time by 50% and reduces costs!

Maximum coordination between wellpoint dewatering, excavation, concrete and rip-rap moved this beach front flood control project ahead by six months. As a result, more than substantial unit cost savings were realized.

Saving time and money by efficient dewatering is a Stang-proved fact. Consult them on your next project for the finest in engineering, equipment and service.

Project: Santa Ana River Improvement;
Orange County, Calif.
Flood Control District
General Contractor:
MacDonald & Kruse
Dewatering Contractor:
Subgrade Engineering





The tougher the going,
the more you'll save in time,
money and on-the-job worry
when you roll your units on
rugged, NYGEN - built

GENERAL TRUCK TIRES

... the work-horse tires that
limit downtime to meal time!

Specify **GENERALS** on your new equipment

THE GENERAL TIRE & RUBBER COMPANY, AKRON, OHIO



Truck wheels, front idlers, support rollers
on all models of Allis-Chalmers crawler tractors

Lubricated at factory need no further greasing

Every Allis-Chalmers crawler tractor—whether produced today or any time during the past 17 years—offers its owner the twin secrets of permanent lubrication.

1



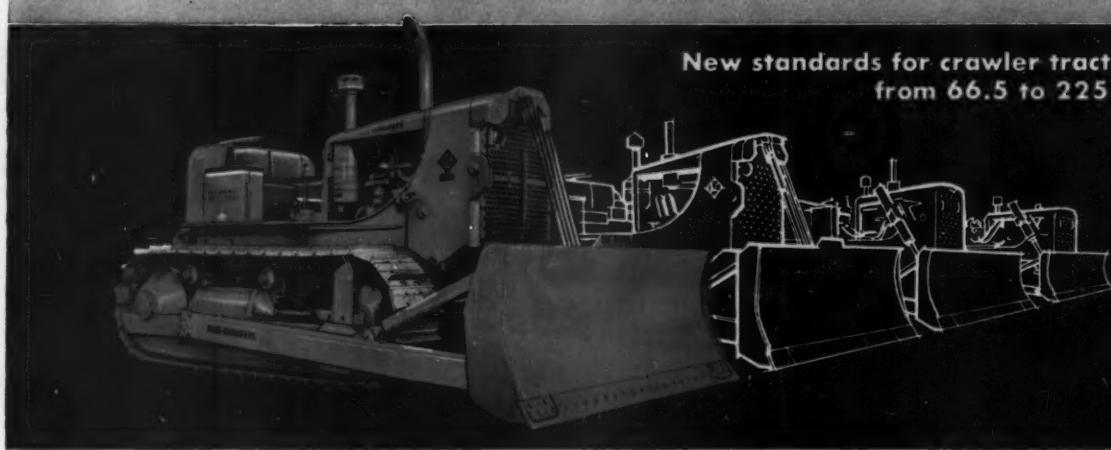
Allis-Chalmers tapered roller bearing wheels roll much more freely than ordinary bushing types . . . reduce power-robbing friction . . . give you more of your engine's horsepower at the drawbar or moldboard where it pays off in production. The tapered roller bearings maintain precise alignment of all parts . . . protect the perfect seal by minimizing side thrust and wobble . . . eliminate the uneven wear that makes positive sealing of bushing-type assemblies impractical.

2

0000

The "Positive Seal" that makes permanent lubrication possible is effected by two steel sealing rings working in combination with the tapered roller bearings. These two rings, smoother than glass, are held firmly together by strong steel coil springs. One seal remains stationary; the other turns with the truck wheel. These seals are micro-finished to near perfect flatness. Their surfaces fit together so precisely that nothing can get through . . . a perfect seal.

New standards for crawler tractors—
from 66.5 to 225 hp



Safe, permanent lubrication of truck wheels, front idlers and support rollers requires seals that will keep all moisture and other foreign materials out . . . the lubricant in. Only Allis-Chalmers offers seals which are positive because of their use in combination with tapered roller bearings. The Allis-Chalmers Positive Seal, tapered roller bearing design has been proved in the field through more than 20 years . . . through millions upon millions of operating hours. When introduced in 1938, this outstanding design replaced bushing-type assemblies similar to those used today in other tractors. Allis-Chalmers abandoned bushing-type truck wheels because, in its opinion, they could not be positively sealed.



Your Allis-Chalmers dealer will be happy to help you estimate the savings in time and material that are yours with Allis-Chalmers permanent lubrication. See him today. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

move ahead with **ALLIS-CHALMERS**

...power for a growing world



BUILT-IN RUST PROTECTION



Blue Brute Air Tools give you a big money-saving feature—they resist rust and corrosion. The reason is an exclusive process: Blu-Coated Parts. With Blu-Coated Parts Worthington Air Tools operate better job after job and in damp atmosphere. They resist wear, seizing, galling. They hold oil better. Even after your toughest jobs you can store them for months without deterioration.

Blu-Coated and Worthington Distributor's Guaranteed Availability Plan keep your jobs going even if your tools are in for checkup or repair. GAP works this way: 1) bring in your Blue Brute tool for repair. While it's in distributor's hands he will, 2) lend you an air tool to keep your job going. See him for complete details, about Blu-Coated, GAP, and assured parts and replacements. 60-15



SYMONS Steel Stake

Can Be Reused Indefinitely

Driven easily into hard earth. Can be used for practically any type of stake work. This popular item is available in 12", 18", 24", 30", 36" and 42" sizes.



SOLO CONCRETE VIBRATOR

The only NEW DEVELOPMENT IN CONCRETE VIBRATORS IN 25 YEARS! 25,000 V.P.M.—"higher than hi-cycle"—this one man tool saves you \$25 per day. It eliminates eccentric bearings and puts the \$40.00 per 100 hours you normally pay for bearing replacement right back in your pocket.

Write for free demonstration. There's a PM Field Engineer near you.



Pacific Mercury

14052 Burbank Blvd.
Van Nuys, Calif.

Manufacturers of the Thomas Electronic Organ

SOME BIG CONTRACT AWARDS OF THE MONTH

Charles H. Tompkins Co., 1737 K St. N.W., Washington, D.C., and **J. A. Jones Construction Co.**, 209 W. 4th St., Charlotte, N.C. A joint venture to erect a headquarters building for Central Intelligence Agency, in Washington, D.C. General Services Administration, 19th and F Sts. N.W. Washington, D.C. \$33,287,600.

S. J. Groves & Sons, 19 Rector St., New York, N.Y. Construct locks, operations building, and guard walls for New Richmond Locks and Dam Project on the Ohio River near Chilo, O. Corps of Engineers, 237 4th Ave., Huntington 18, W. Va. \$25,216,378.

O. W. Burke Co., 1032 Fisher Bldg., Detroit, Mich. Erect an office building with 286,000 sq ft floor space in Kalamazoo, Mich. Upjohn Co., 310 Henrietta St., Kalamazoo, Mich. \$14,500,000.

Baltimore Contractors, Inc., 711 S. Central Ave., Baltimore, Md. Construct additional wings for Bancroft Hall at the Naval Academy, Annapolis, Md. Dist. Public Works Office, Potomac River Naval Command, Naval Gun Factory, Washington, D.C. \$10,339,000.

Peter Kiewit Sons' Co., 345 Kieways Ave., Arcadia, Calif. Construct 2 mi of interchange roadway including bridges and ramp structures between Santa Ana and Golden State Freeways in Los Angeles. State Div. of Highways, 120 S. Spring St., Los Angeles, Calif. \$9,725,920.

Foster-Creighton Co., First American National Bank, Nashville 3, Tenn. Erect a hospital and adjoining facilities at the University of Kentucky, Lexington, Ky. Commonwealth of Ky., Div. of Purchases, Frankfort, Ky. \$8,935,000.

S. J. Groves & Sons Co., Box 1059, Springfield, Ill. Construct aprons, taxiways, and support facilities at Bong Air Force Base, Kansasville, Wis. Corps of Engineers, 475 Merchandise Mart, Chicago, Ill. \$7,845,454.

NEW! FORD SELECT-O-SPEED

10 SPEEDS FORWARD; 2 REVERS

Now, with Ford industrial tractors, you can shift to *any* speed under full load and on-the-go! A light touch on the Select-O-Speed lever is all you need to select instantly the right gear to meet changing operating conditions. There's no clutching required to start, stop, change gears, or to engage or disengage PTO. There's no conventional gear selector. You merely move the selector for the desired speed. Hydraulic power does the work of shifting.

New Ford Select-O-Speed will save you time, save you fuel, save you effort. And because you can instantly shift up or down according to varying conditions—on-the-go and without loss of power or momentum—you'll handle bigger jobs in your tractor power range. Select-O-Speed transmission is available for all series of Ford tractors . . .

AND ONLY FORD HAS



NOW!

Shift to any speed



on the

GO!

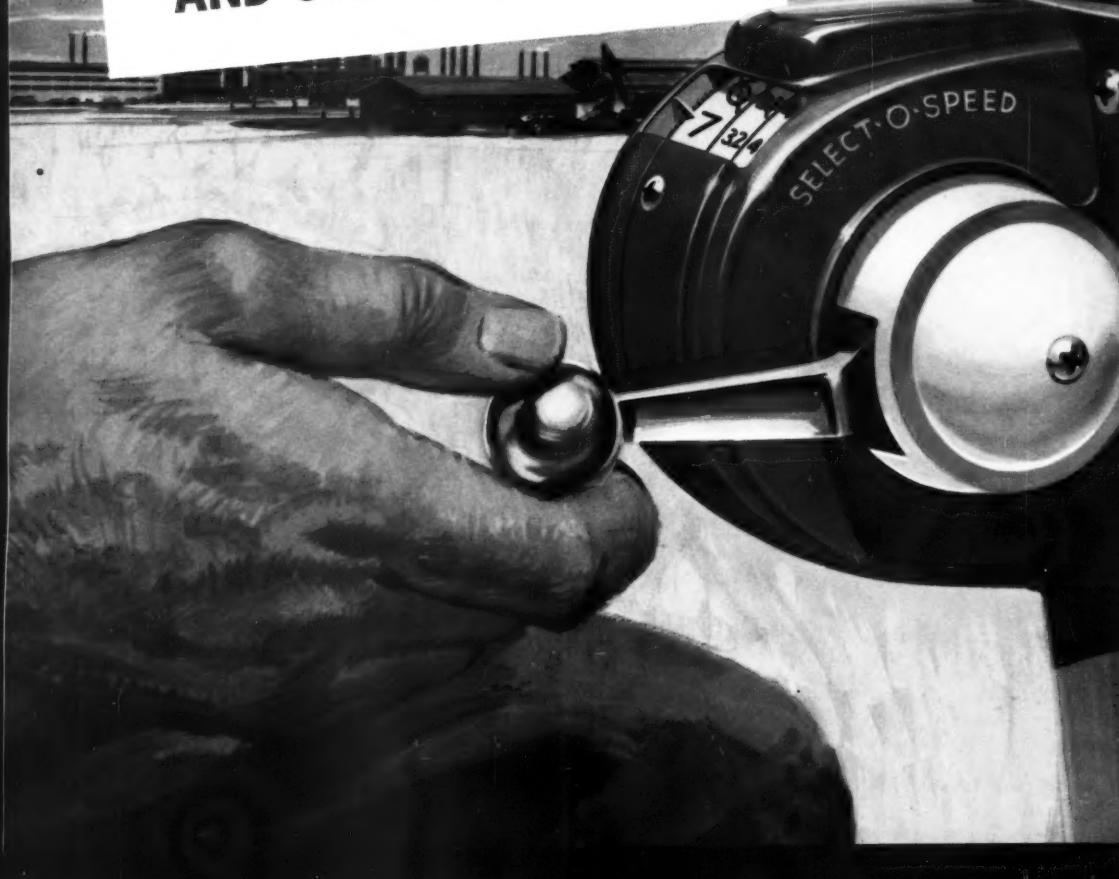
NEW! FORD SELECT-O-SPEED

10 SPEEDS FORWARD; 2 REVERSE

Now, with Ford industrial tractors, you can shift to *any* speed under full load and on-the-go! A light touch on the Select-O-Speed lever is all you need to select instantly the right gear to meet changing operating conditions. There's no clutching required to start, stop, change gears, or to engage or disengage PTO. There's no conventional gear shift. You merely move the selector for the desired speed. Hydraulic power does the work of shifting.

New Ford Select-O-Speed will save you time, save you fuel, save you effort. And because you can instantly shift up or down according to varying job conditions—on-the-go and without loss of power or momentum—you'll handle bigger jobs in every tractor power range. Select-O-Speed transmission is available for all series of Ford tractors . . .

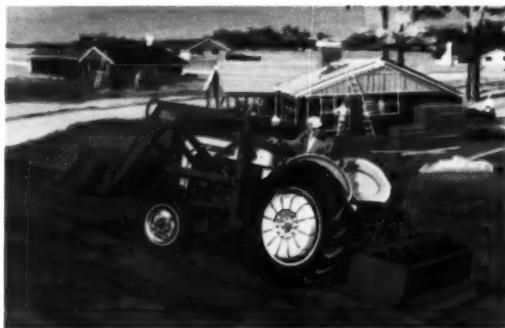
AND ONLY FORD HAS IT!



Greatest Industrial Tractor Advance Since Hydraulics!



LOADING AND BACKFILLING—A touch moves the selector lever to pre-selected stops for easy back-and-forth shifting. You eliminate five clutch and gear shift movements every time you move from pile to truck to pile. Down-shift on-the-go as you buck into the pile. Break out heaped payloads every time!



GRADING AND LEVELING—Down-shift in a wink without loss of forward motion when you hit tough spots. As the load eases, shift up again for more speed, more fuel economy. Pull high spots into low ones with quick shuttle-type passes. Use Ford's low, low speeds for more "push" when needed, and for smooth, uniform finish work.

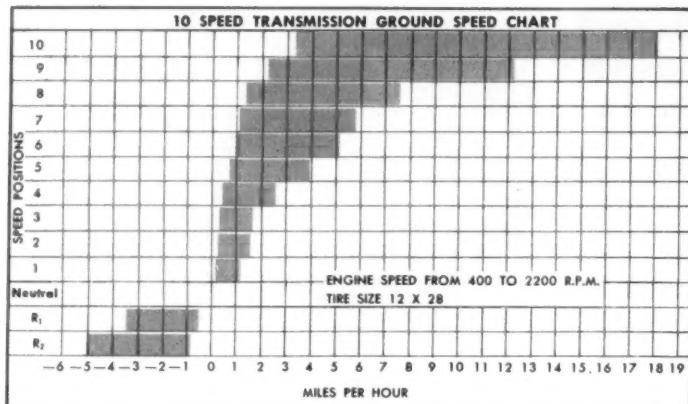


SNOW REMOVAL—With Select-O-Speed you have easy shifting to powerful low gears for big drifts, and to higher, fuel-saving gears when the going is easy. Extra safety is at your finger tips, too, with Select-O-Speed brake assist for stopping on ice.

Design, materials and/or specifications are subject to change without notice and without liability therefor.

SELECT-O-SPEED DETAILS, BACK PAGE

MATCH SPEED AND POWER INSTANTLY FOR PEAK EFFICIENCY



Select-O-Speed lets you instantly choose the exact combination of ground speed and tractor power for top efficiency and fuel economy—not just for the job, but for minute-to-minute variations in operating conditions. Generous overlapping of the 10 forward and 2 reverse speeds at different engine speeds makes it possible to get the desired ground speed in several different gears.

EXTRA SLOW SPEEDS—Creep along as slow as .6 mile per hour at 1200 rpm. A finger touch calls forth extra power for tough spots. And you'll give precision work the look of a hand finish!

UP TO 18 MPH—Fast travel for light towing jobs, highway transport, etc. Select-O-Speed provides extra safety at fast road speeds. You down-shift on-the-go without clutching.

SEE SELECT-O-SPEED FOR YOURSELF . . .

AND LOOK FOR THESE FEATURES

QUICK-CHANGE LEVER—Selector lever can be changed to left or right side in less than a minute—an added convenience for loader work.

ADJUSTABLE STOPS—Pre-select any of five gears and set stops for the ones desired in shuttle operations. Stops are easily bypassed for other speeds.

INCHING CONTROL—Foot pedal operates feathering valve which lets you inch forward or backward for attaching equipment, doing precision work, or starting heavy tow-loads smoothly. It also interrupts power for emergency stops.

NO "RUNAWAYS"—Rear wheels lock when selector is in "Park" position or when engine is off. You can safely leave the tractor, even on a slope.

TRANSPORT DISCONNECT—Prepared in less than a minute to be towed from job to job at regular truck speeds.

INDEPENDENT PTO—Separate power take-off handle gives easy control of mowers, rotary cutters, etc. PTO is completely independent of gear ratio change and forward movement of tractor and can be gradually engaged.

SELECT-O-SPEED RANGE, MPH			
Gear	Engine RPM		
	1200	1750	2200
10	9.8	14.3	18.0
9	6.7	9.7	12.1
8	4.1	6.0	7.5
7	3.2	4.6	5.8
6	2.8	4.0	5.1
5	2.1	3.1	3.9
4	1.3	2.0	2.5
3	1.0	1.4	1.7
2	.9	1.3	1.6
1	.6	.9	1.2
Neutral	—	—	—
R1	1.9	2.8	3.5
R2	2.8	4.1	5.1
Park	—	—	—

Handle Bigger Jobs in Every Tractor Power Range ... And at Less Cost!

EXTRA DRAWBAR PULL—You can double your pull power merely by changing from 6th to 4th gear. Moving from 10th to 4th increases your power 8 times! Start extra-heavy loads in a low gear; shift up as your tractor gains momentum. Shift down on-the-go through tough spots; up again when the work eases.

MATCH TO LIGHT LOADS, TOO—Save on fuel, on tractor wear by selecting higher work gears and throttling engine back to a lower rpm. Just look at the overlapping range of speeds in the table and graph above.

FAST, SAFE HIGHWAY HAULING—Start smoothly with your inching control . . . down-shift on-the-go for extra power as you climb the hills, and for brake assist as you come down. Bigger, faster, safer hauling—and all the while it "babies" your tractor!

What is SELECT-O-SPEED?

What makes Ford Select-O-Speed unique and boldly different from any transmission ever seen in industrial tractors is the way its four-stage planetary system is controlled—by hydraulics. Select-O-Speed offers manual gear or speed selection, "solid drive" and the other advantages of a gear type transmission, and also the time- and effort-saving advantages of hydraulic power shifting of that transmission.

Select-O-Speed is the world's most advanced tractor transmission . . . stronger because there is three times as much gear tooth contact as in conventional transmissions . . . silent because helically cut gears are always

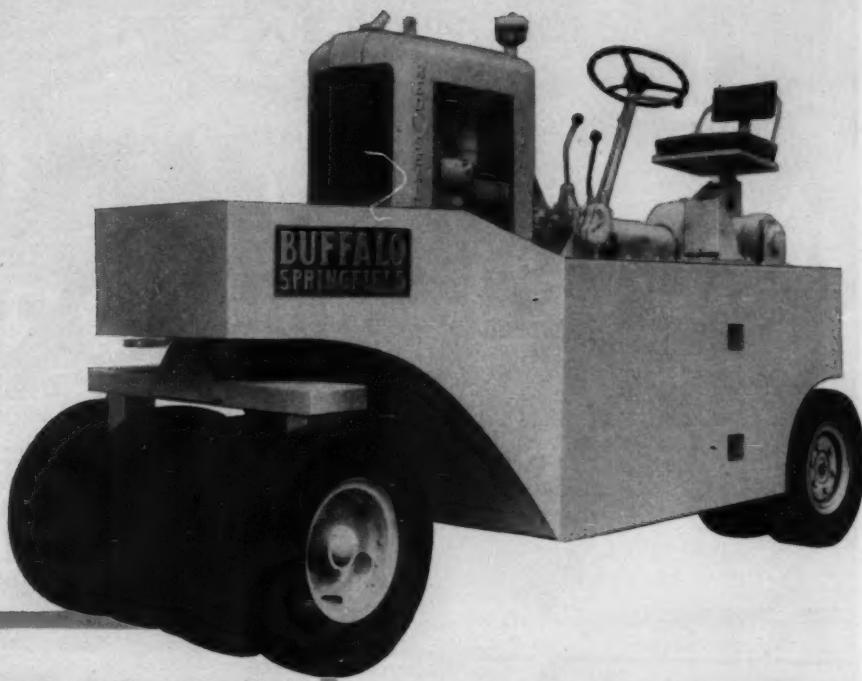
in mesh, can't clash . . . efficient because there is no slipping, no appreciable power loss . . . simple to operate, one lever changes speeds . . . economical, saves time, fuel, and effort.

Seeing is believing. Trying is even better. Visit or phone your Ford Tractor and Equipment Dealer right now to arrange a demonstration of Select-O-Speed on the Ford tractor of your choice, or write to Ford Industrial Sales Department, 2500 East Maple Road, Birmingham, Michigan. You'll agree the new Ford Select-O-Speed transmission is the greatest tractor advance since hydraulics!

ANOTHER pneumatic-tire roller from Buffalo-Springfield...

NEW

**PSR-9 with
3 to 10 tons
of
compaction
load on
9 wheels!**



Variable-weight: 720 to 2270 lbs. per wheel

- Compacts all courses of flexible-type pavements: sub-base, base, surface materials.
- All wheels oscillate for contour compaction — 1-in. tire overlap gives 100% surface contact.
- Positive 4-wheel drive through twin propeller shafts (one to each pair of driving wheels).
- Shafts transmit power direct from bevel-gear differential to final drive case at wheels.
- Smooth starts, stops, reversing — infinite speed selections to 15 mph forward, reverse.
- Speed changes controlled by hydraulic power shifting through a 3-range, full-reversing transmission, and torque converter.
- Automotive power-steering, 4-wheel hydraulic brakes, mechanical parking brake, plus . . .
- . . . low center of gravity, assure maximum operating ease, stability and safety along shoulders, elevated curves, steep grades.

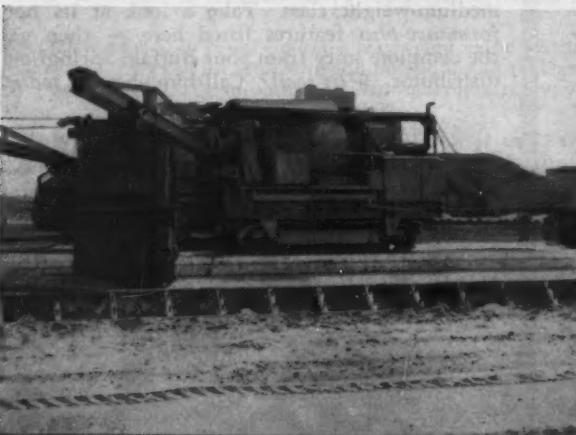
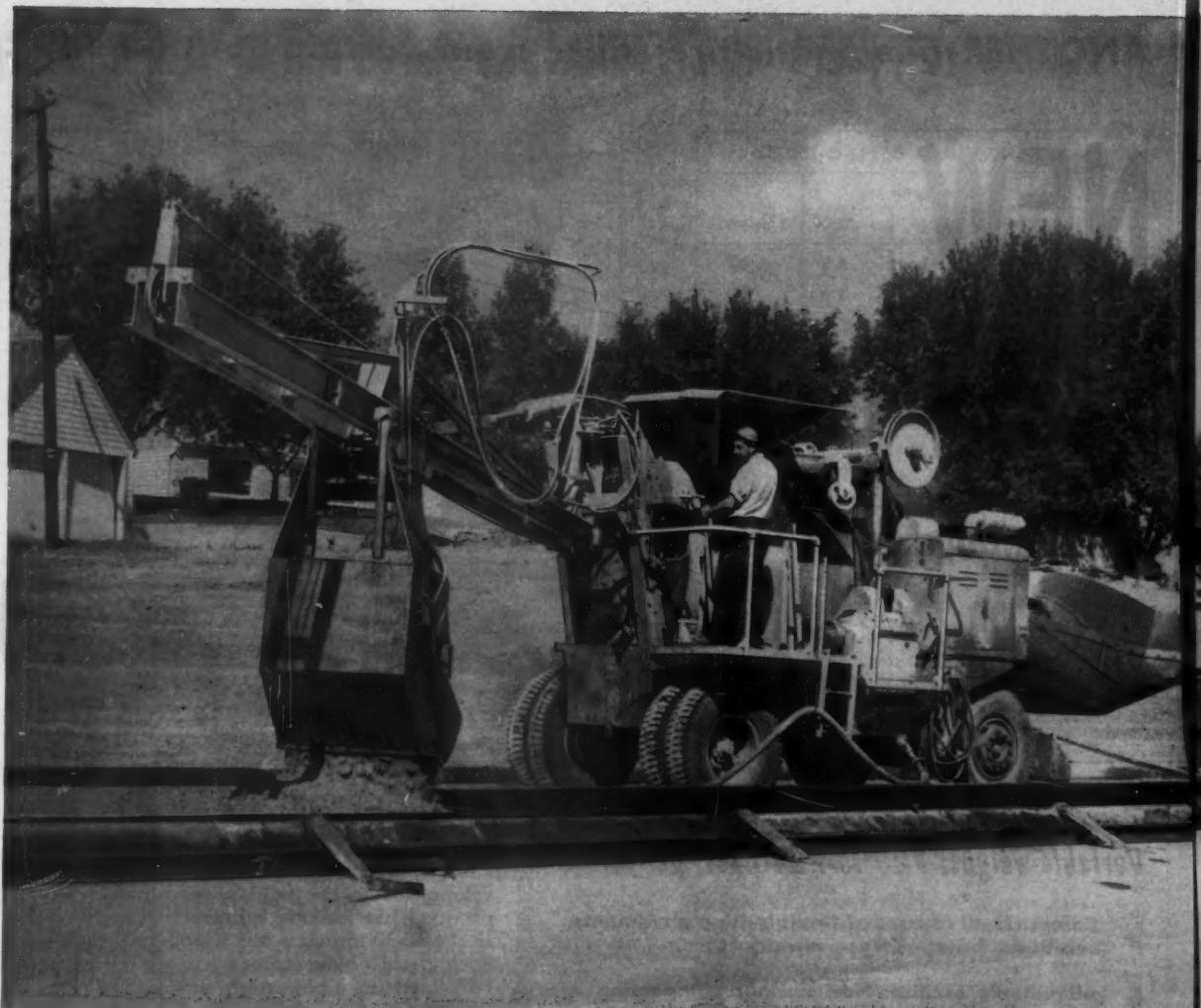
Good operating visibility, too — 360° swiveling seat. Frame design keeps the guide and drive wheels in view.

Here are some interesting new developments in the field of pneumatic-tire compaction. Just recently, a big, self-propelled roller in the 10-30 ton class was introduced by Buffalo-Springfield®. Now comes a 3-10 ton self-propelled PSR-9, setting a new, high "standard of comparison" for quality, performance, durability in the medium-weight class. Take a look at its *performance-plus* features listed here — then get the complete story from your Buffalo-Springfield distributor. *Why wait?* Call him about it today.

BIG PSR-30 gives you 10 to 30 tons of compaction load on 7 pneumatic tires. Variable-weight wheel loads range from 3340 to 8600 lbs. per wheel to suit various material and density requirements. Speed range: from 0 to 19.4 mph through smooth torque-converter drive, 3-range full-reversing transmission.



BUFFALO-SPRINGFIELD ROLLER CO.
SPRINGFIELD, OHIO • DIVISION OF KOEHRING COMPANY



Big 34-E twinbatch team working side-by-side widened runways on this military airbase, completed job "on the double". Notice how one long-boom paver reached the outside half, while the other 34-E poured the inside half of the strip. For dependable, high-production output on your major road and airport paving contracts, better look into the big Koehring 34-E.

"Timely" precision-finishing is important on any paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete — harsh, wet or dry. It overcomes slump difficulties on elevated curves, grades — produces smooth, mechanically accurate slab surface, with uniform crown transitions.



16-E *twinbatch*[®] OFFERS a time-saving idea FOR YOUR PAVING JOBS

On most street and highway paving, there's extra concrete to be poured in addition to the main slab — such as: center-strips, scattered intersections, curbs, gutters, culverts, approaches to driveways, bridges and side-roads. These jobs require the time-saving mobility of a rubber-tired paver — and here's an answer to the problem.

Mobile as a batch truck

With a Koehring 16-E *twinbatch* in your paving spread, you can get back on new slab *in as little as 7 days* to do clean-up work, pour adjoining slabs, or widen highway and airport strips. It works on or off-pavement, drives from one work-section to the next under its own power. Where frequent moves are involved, this saves waiting for trailer, loading and unloading delays.

For all its time-saving mobility, the Koehring 16-E *twinbatch* is primarily a production paver. On main slab work, it hits a top output of 86.7 batches

an hour (based on 60-second mixing cycle). This *reserve* production capacity with Koehring *twinbatch* Autocycle mixing lets you pick up any lost time resulting from bad weather and other normal job delays.

Averages 50 yds. an hour

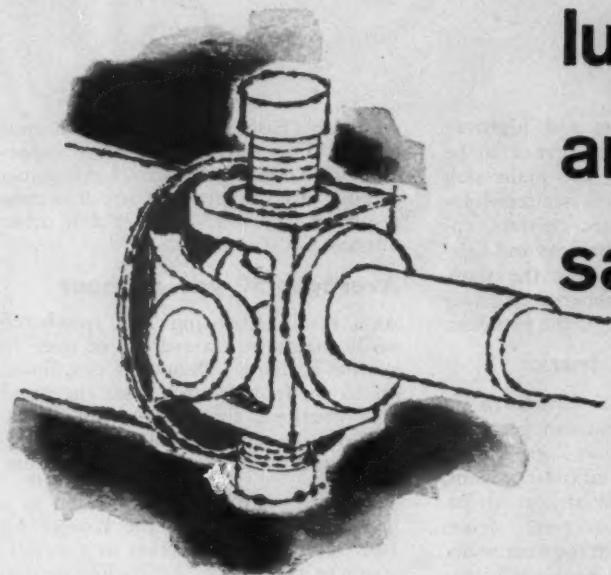
As a result, Koehring 16-E *twinbatch* easily maintains an average of over 76 batches an hour — 8 hours a day. Based on 16 cu. ft. per batch, plus the usual 10% overload, this assures you 50 cu. yds. of concrete per hour on straight-production paving — with a small crew.

While its usefulness is unlimited as a general-purpose paver, the Koehring 16-E *twinbatch* also serves as a mobile concrete mix plant. It discharges into overhead hoppers, forms, chutes, loads trucks. Boom elevates 60° — gives controlled discharge at 21-foot height (higher with special boom). Do you want to learn more about it? Your local Koehring distributor is the man to see. Better call on him right away.



New Koehring Transverse Finisher — One-man operated, this fast-working unit provides efficient low-cost finishing — produces a slab surface 10 to 30 feet wide that meets the most rigid highway and airport specifications. A single lever control assures uniform crown transitions. 2 adjustable oscillating screeds on new Transverse Finisher handle all types of concrete.





Universals... lubrication... and how to save money

Sinclair Litholine® multi-purpose grease replaces 3 different ordinary greases—chassis, wheel bearing, water pump. It therefore cuts unnecessary inventory costs. Furthermore, it eliminates the danger of misapplication. This superior lubricant has earned a reputation for lengthening lube intervals—prolonging life of universals and other vital parts. Change to Litholine, now. And when management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

Find out how Litholine can help you.
Call your nearest Sinclair Representative
or write for free literature—Sinclair
Refining Company, Technical Service
Division, 600 Fifth Ave., New York 20, N.Y.
There's no obligation.

Sinclair
Litholine
Multi-Purpose Grease

**PICTURE
OF THE
MONTH**



On a Steep, Rocky Slope

• Course of the Second San Diego Aqueduct runs up grades as steep as 56% and over rocky desert country where the trench must be blasted. On this 47% slope, rock formations close to the surface made benching impractical so El Monte contractor Vido Artukovich & Son pulled their Bucyrus-Erie 54-B crane up the slope with a train of three Caterpillar D8 tractors, then leveled it into laying position on a heavy timber wedge. United Concrete Pipe Corp. supplies the 75-in. cylinder pipe for the 100-mile project.



GMC OPERATION “HIGH GEAR”

brings you the
greatest money-saving, money-making
construction trucks ever built!

Operation "High Gear" is the biggest engineering, design and quality-control program ever known! It's an entirely new concept in modern truck transportation, backed by the keenest brains and manufacturing know-how

in the business! Results: New truck values, new dependable endurance, new low operating and upkeep costs. See your GMC Dealer for proof, today. GMC Truck & Coach—a General Motors Division.



NEW! LASTING LOW-COST POWER

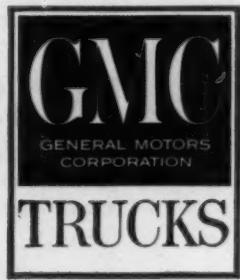
Now you can get the most economical diesel in any construction truck—the new GMC 6-71SE two-cycle power plant. This fuel-saving champ has exclusive economy range governor and automatically controlled fan. Available with 189 or 210 H.P. Other GMC engines include economical, powerful V-8's and Sixes.

NEW! TRUE-TRUCK FEATURES

For the rough, tough usage of construction trucks, GMC has installed strongest front crossmembers, new extra-heavy-duty clutches, bigger brakes and stronger prop shafts. In many models you also get these GMC Extra-Value features at no extra cost—M-400 bearings that last seven times longer, standard synchromesh transmissions and the easiest mechanical steering, recirculating ball-type.

NEW! SPECIALIZED CONSTRUCTION MODELS

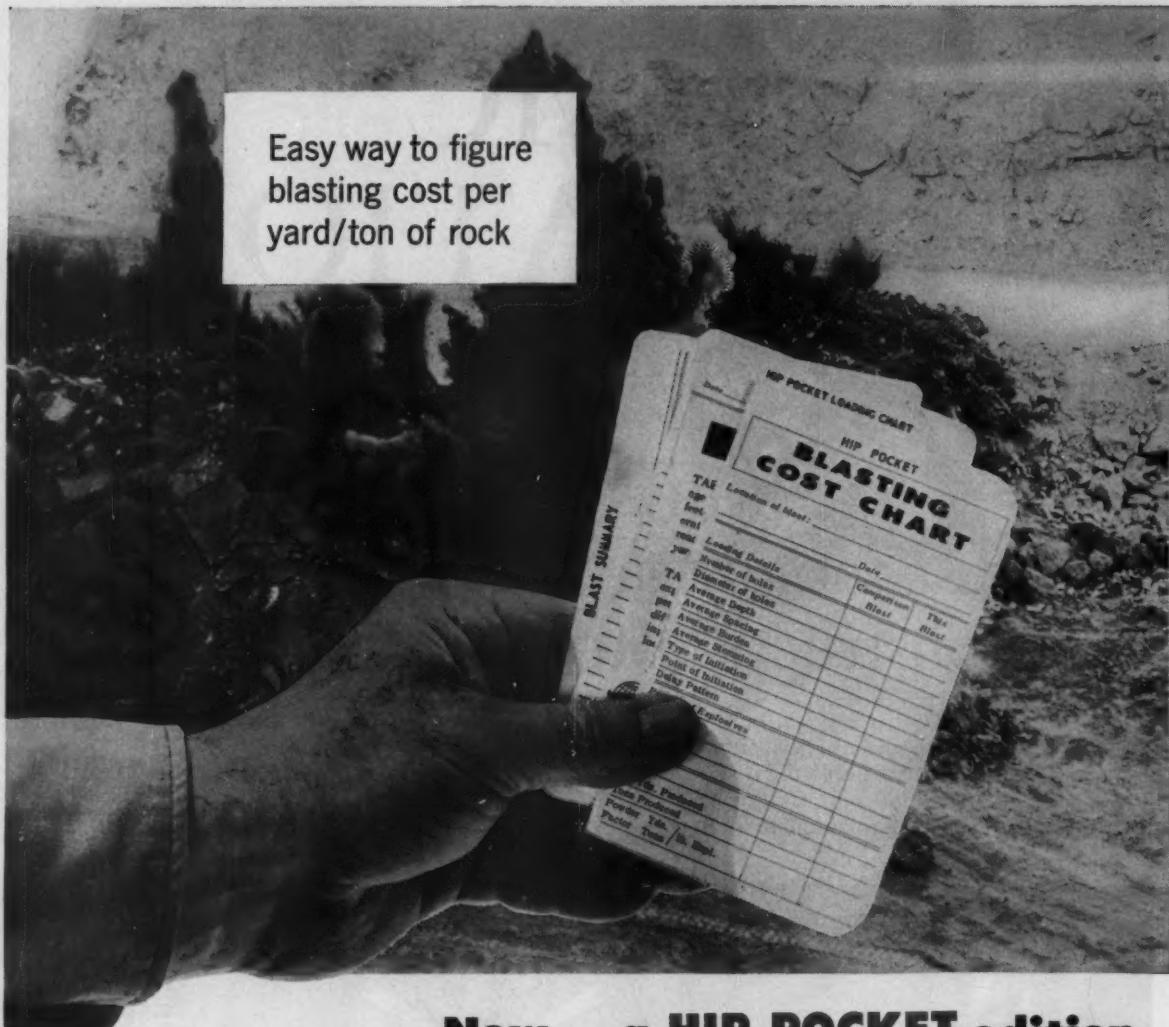
Any size, any shape! Conventional and COE design, world's biggest selection of six-wheelers, complete line of pickups including new Wide-Side and 4 x 4 models, new FW550 six-wheelers with 46,000 lbs. GVW designed specifically for 6-7 yard mixers and 10-cubic yard dumps even in states with 32,000-lbs. axle laws, plus 13 special off-highway models with up to 63,000 lbs. GVW.



Watch for more great truck advances from GMC!

From $\frac{1}{2}$ -ton to 45-ton...
General Motors leads the way!

Easy way to figure
blasting cost per
yard/ton of rock



Now...a HIP POCKET edition of the **Atlas BLASTING COST CHART**

Here's a new 1959 Atlas Blasting Cost Chart that goes right out on the job with you—helps you record the cost data you need to protect your profits.

The original Blasting Cost Chart, with instruction book and Slide Rule, is being used successfully by hundreds of operators. Now, to make it more convenient, Atlas has added this "hip-pocket" edition. With it you can compare results from blast to blast to determine methods that pay off best. It helps you assemble quick cost facts on drilling, secondary breakage, digging, hauling, and crushing.

Your Atlas representative will be glad to show you how to use the new "hip-pocket" Cost Chart. He has a kit full of information that may help reduce your costs and protect your profits. Ask him for details, or write us direct.



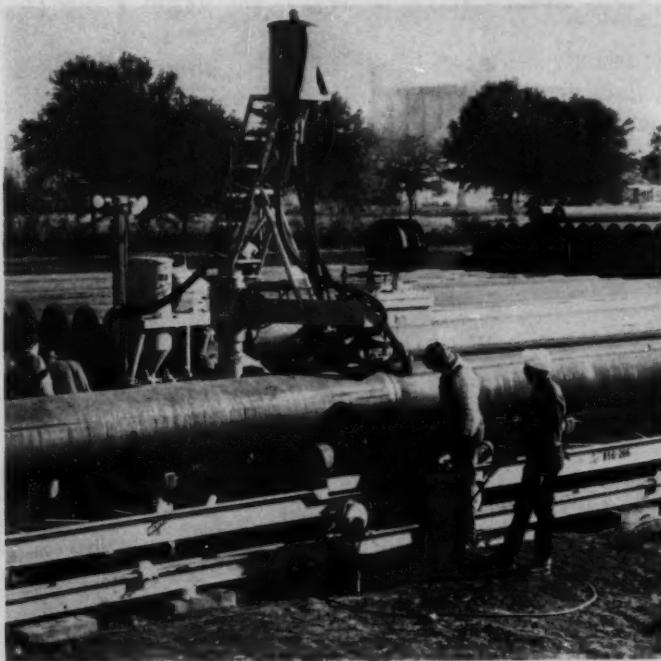
Ask your Atlas representative to show you the electric match demonstration . . . See why Atlas E. B. Caps lead the field in dependable performance.



Construction News in Pictures . . .

Mobile and Automatic

This automatic pipeline welding machine is mobile enough to move along the pipeline right-of-way, working at selected locations. Bechtel Corp. of San Francisco developed the rig and is using it on an 80-mile stretch of 24-in. pipeline between Baton Rouge and Lake Charles, La. They say the machine completes a weld in 5 to 7 minutes.



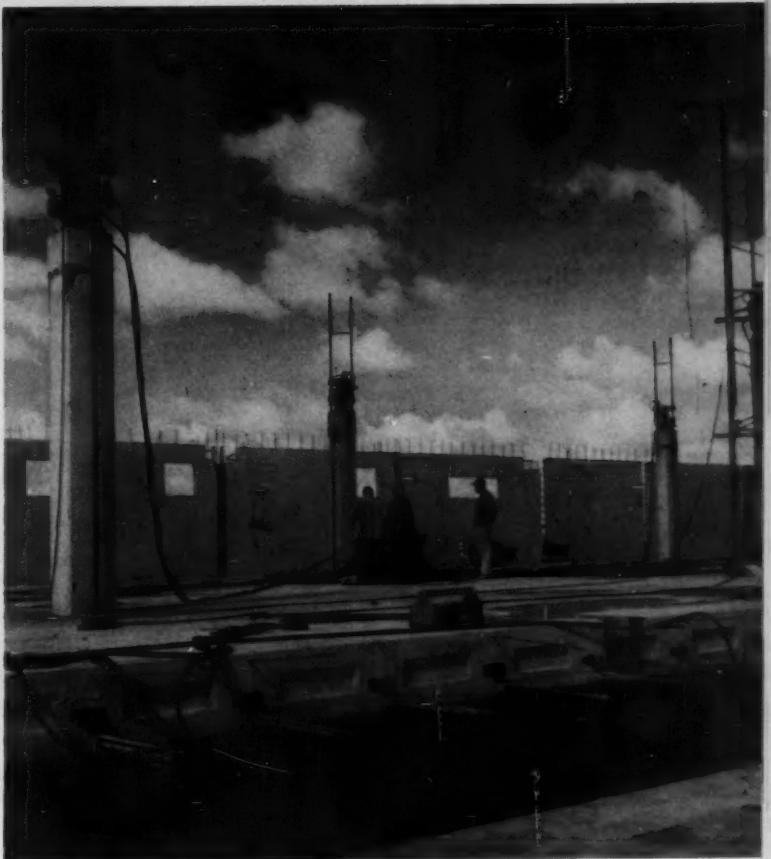
It Gets Around

A pair of rubber-tired wheels that can be raised or lowered makes it easy to tow this finisher from job to job. Huron Construction Co. of Chatham, Ont., Canada modified the Blaw-Knox machine and has it at work spreading and finishing 12-in.-thick concrete slabs for taxeways and aircraft parking areas at Malton Airport, near Toronto.

Lift-Slab Roof

A pair of screwjacks on top of each concrete column raises 19-in.-thick waffle slab that will form the roof of a new Ryan Aeronautical Co. plant near San Diego, Calif. Operator at console controls movement of slab up 18-ft columns spaced at 40-ft intervals. Vagtborg Lift Slab Corp. handled the lift for general contractor J. A. McNeil Co.

continued on page 72



BUILT TO BOOST C ONTRACTOR
P ROFITS



"Power Vane" Rotary Compressors supply air-operated hammers on each of the three pile-driving rigs shown here. On this job, 2800 piles are being driven in "tough ground" to a depth of

53 feet below subgrade. You can't beat CP Rotaries for dependable performance when air demand is heavy. Capacities: 125; 210, 365, 600 and 900 c.f.m.

IT TAKES EQUIPMENT WITH **POWER** AND **STAMINA** TO SAFEGUARD THE PROFIT ON TIGHT SCHEDULES

Whether the job is supplying air for pile-driving operations in balky material, drilling hundreds of blast holes through splintery shale, or bolting structural steel at breathtaking heights . . . you will find CP equipment has the muscle and the stamina to handle your toughest schedules. Helps you pick up the profits too — because it

will stay on the job 24 hours a day under the severest conditions. That's why we say "Built to Boost Contractor Profits." Have your CP equipment distributor give you more complete information, or write for Catalog 600-8. Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.



CP Torque Control Impact Wrenches like this tighten thousands of high strength bolts to exact tightness.

Bolting gangs like the 15-1/2" length and 23-lb. weight that help crews hold top speed on tight schedules.

CP self-propelled Tracdrills working in rugged rock formations like this cut costs by easily hauling own air supply up 10% grades when necessary . . . move quickly from hole to hole. Simple, positive hydraulic controls make one-man operation practical. A time-saving piece of equipment in rough going.



Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AIR BLAST BITS

**CONSTRUCTION NEWS
IN PICTURES . . . continued**

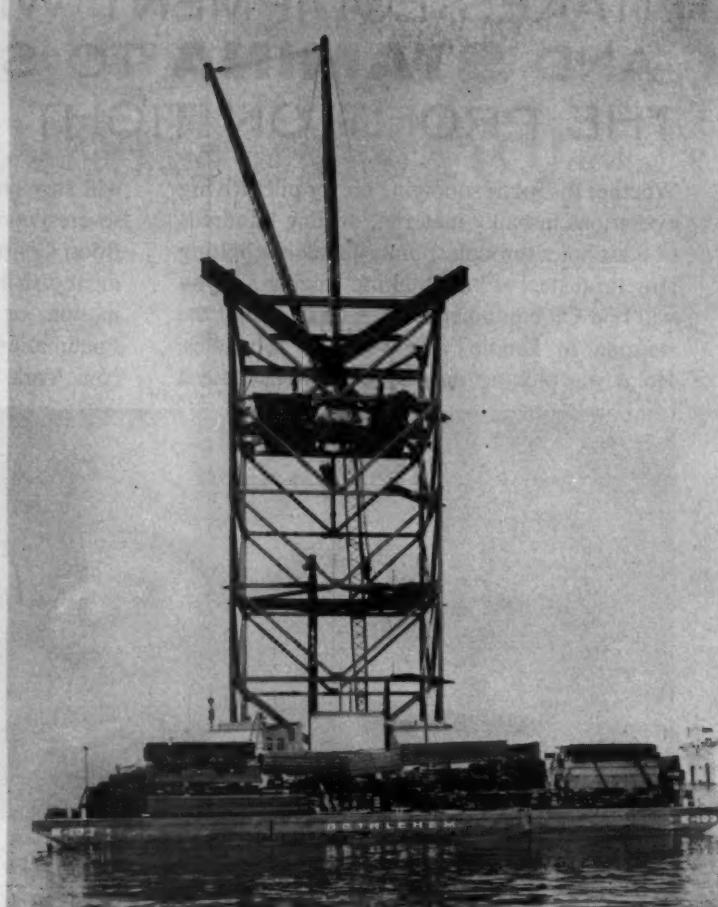
Bridge Builder

Guy derrick jumps stiff legs, mast, and boom to the top of a 120-ft steel tower to complete a floating tower derrick that will have a reach of 240 ft and a lifting capacity of 80 tons. With this rig, Bethlehem Steel Co. will erect the twin 326-ft steel towers to support the main span of the Throgs Neck Bridge in New York City.



Pouring Concrete Pipe

A collapsible rubber and fabric balloon serves as a form for pouring seamless concrete pipe. The 50-ft-long balloon is laid in the ditch and inflated, and a tamping machine moves along the ditch, feeding concrete around the form. Arizona inventor Bud Fuller and the Goodyear Rubber Co. developed and are testing the new method.



Army Ingenuity (below)

Men of the 497th Port Construction Company, Army Corps of Engineers, lower a 110-ton steel bridge onto its sills across Dogue Creek at Fort Belvoir, Va. They assembled the 120-ft bridge at a work site 4 miles upstream on the Potomac River, floated it to the erection site on a specially built barge, and put it in place with four jacks.





This
EATON 2-SPEED AXLE
is Saving Dollars
for its Owner!

Truck operators derive many worthwhile benefits through the use of Eaton 2-Speed Axles—ability to pull out under full load, quicker trips, safer operation, reduced driver fatigue, longer truck life, greater trade-in value.

But a big reason why more and more truckers in all fields of heavy duty hauling are specifying Eaton 2-Speed Axles is that this equipment effects important reductions in operating and maintenance costs—which is another way of saying: they add to profits!

Ask your truck dealer to show you how Eaton 2-Speed Axles can make big savings in your hauling operation.



More than Two Million
Eaton Axles in Trucks Today.

EATON ————— **AXLE DIVISION** —————
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps
Truck and Trailer Axles • Truck Transmissions • Permanent Mold Iron Castings • Automotive Heaters and Air Conditioners
Fastening Devices • Cold Drawn Steel • Stampings • forgings • Leaf and Coil Springs • Dynamatic Drives and Brakes
Powdered Metal Parts • Gears • Variable Speed Drives • Speed Reducers • Differentials • Centralized Lubrication Systems

K&M ASBESTOS- CEMENT SEWER PIPE

Sewer pipe maintenance headaches disappear when you install "K&M" Asbestos-Cement Sewer Pipe.

Flow-stopping, pipe-clogging roots . . . no matter how cobwebby-thin . . . can't penetrate the exclusive patented "K&M" FLUID-TITE coupling . . . unmatched in its tight sealing. In repeated tests, "K&M" Asbestos-Cement Sewer Pipe successfully resisted infiltration even when external water pressure was 25 psi . . . the equivalent of a 58-foot head and way above field conditions.

Service remains continuous and uninterrupted . . . with fewer inspections and periodic cleanings. You can reduce treatment loads and costs . . . because infiltration is eliminated. Being made of quality asbestos fibers and portland cement, "K&M" Sewer Pipe does not corrode and is immune to electrolysis.

In fact, "K&M" Asbestos-Cement Sewer Pipe is a tax-saver at every stage of construction: planning and installation, as well as maintenance. Transportation and handling is less expensive, because "K&M" Asbestos-Cement Sewer Pipe is light in weight.

In short, practically indestructible materials plus eighty-five years of asbestos engineering give you the finest, most dependable sewer pipe available. That's why we urge you to write today for more information.

5 CRUSHING STRENGTHS OF K & M SEWER PIPE

Size Inches	Class 1500	Class 2400	Class 3300	Class 4000	Class 5000
8	1500	2400	3300		
8	1500	2400	3300		
10	1500	2400	3300	4000	5000
12	1500	2400	3300	4000	5000
14	1500	2400	3300	4000	5000
16	1500	2400	3300	4000	5000



KEASBEY & MATTISON
Company • Ambler • Pennsylvania

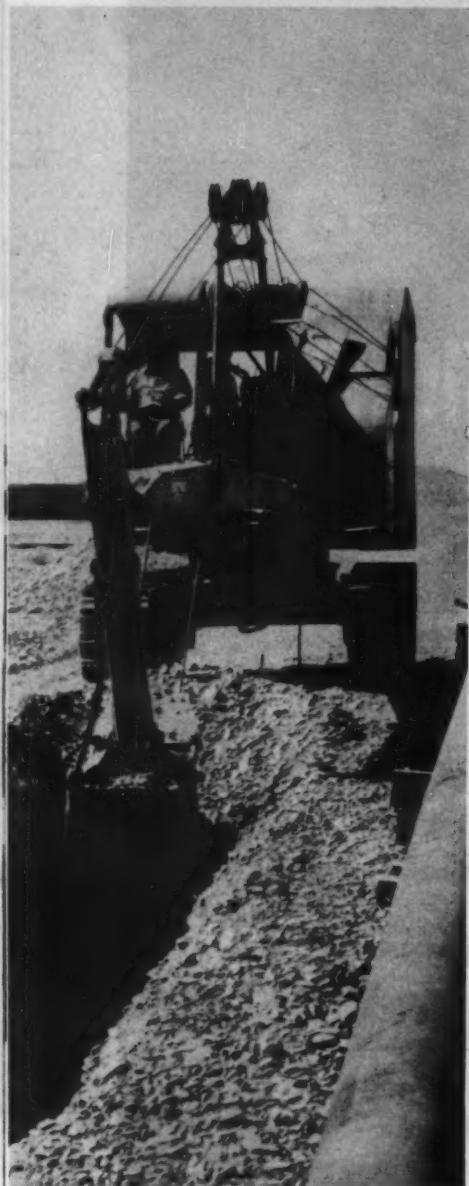


AUTOMATICALLY ROOT-TIGHT



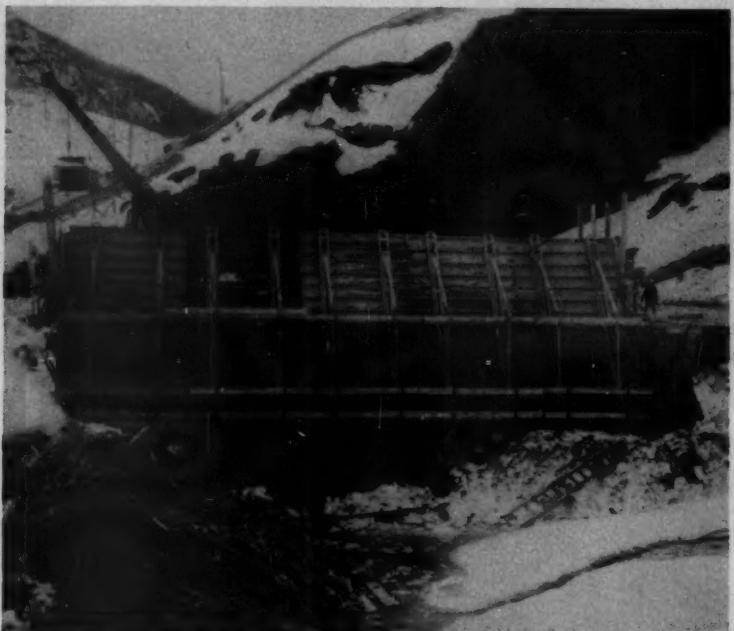
Exclusive **FLUID-TITE** Coupling joins lengths of various crushing strengths and sizes. Assemble it in any weather—without the aid of heavy machinery. It's water-tight and root-tight.

Construction 'Round the World . . .



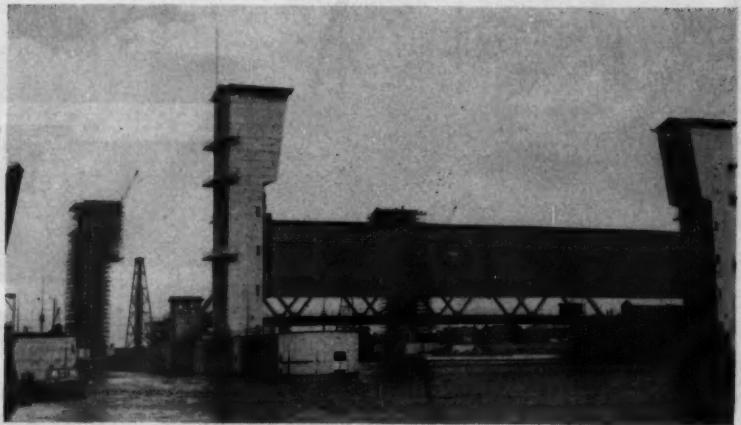
In Iran

Bucyrus-Erie backhoe rapidly excavates trench for a 200-mi pipeline between Teheran and Rescht for the National Iranian Oil Company. A Merritt-Chapman & Scott-sponsored joint venture with Cheney Construction Co. and B&M Construction Corp., both of the United States, holds a \$6-million contract for the placing of the 6 and 8-in. pipe.



In Canada

Blaw-Knox cantilevered steel forms $7\frac{1}{2}$ ft high retain concrete going into the Bersimis River Dam under construction near Forestville, Que. The forms depart from conventional 5-ft forms in that adjustable steel panels support imbedded water stops in the transverse construction joints. Two trussed cantilevered strongbacks brace each panel.



In The Netherlands

A steel gate that weighs 635 tons, is 266 ft long and 39 ft high will protect a low-lying area from inundation in the event of dangerously high tides. Two derrick barges, with help from four tugs, placed the gate in position between lift towers at high tide. A second gate and a lock also are underway.



**Ask the man who
runs the job!**

*...no one makes a
tougher tooth
than ESCO*

**The construction industry
looks to**

The right design, the right steel, the right
shape make *ESCO* Points and Adapters
right for every digging condition.



Electric Steel Foundry Co., PORTLAND, OREGON

See reverse for shapes and size range >

Here are the points to remember...

12M ALLOY STEEL

ESCO 12M Points are the toughest you can buy. Developed through years of research for the construction industry, cast ESCO 12M is carefully heat treated to produce the finest steel made for the severe shock and abrasion encountered by points and adapters.

RIGID QUALITY
CONTROL TESTS
ASSURE
TOUGHNESS,
HARDNESS



Every ESCO Point is Brinell tested to assure the exact degree of shock-absorbing toughness and abrasion-resisting hardness for longer digging life. Be sure to look for the Brinell mark on every ESCO Point you buy.

8 POINT SHAPES

You can select from eight different shapes to find the point that matches your digging conditions. ESCO Points are designed by bucket and excavation specialists who know how to achieve top digging performance. The self sharpening design of an ESCO Point makes it start sharp and stay sharp.



ESCO Point shapes start sharp, stay sharp and last longer under any digging condition.

ESCO Points and Adapters for all digging equipment

Your local ESCO dealer can supply Points and Adapters for all your digging needs. By using ESCO Points and Adapters on all your equipment you can cut costs further by reducing your point inventory and consolidating purchases. Call your ESCO dealer today for details. He's listed in the yellow pages of your telephone directory. Or, write direct.

LITHO I
esco

Electric Steel Foundry Company
2149 N.W. 25TH AVE • PORTLAND 10, OREGON

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities

ESCO INTERNATIONAL, NEW YORK, N.Y. • IN CANADA ESCO LTD.



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Hit a
quickly
a scrat

For th
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his wa

It keep
transm
strains
openin
nance
equipm

It's eas

Time



"Nothing pulls you through tough scrapes like **TORQMATIC DRIVE**"

Hit a particularly tough stretch of grading and you'll quickly discover what TORQMATIC DRIVE means in a scraper.

For that's when TORQMATIC's precision-power control pays off. The operator feeds just the power he needs, whether he's humping the blade or bucking his way through a hardpan cut.

It keeps your scrapers on the job, too. For the power-transmitting oil in a TORQMATIC soaks up stresses and strains that could mean trouble. The pay-off: eye-opening records for the fewest repairs, least maintenance and highest availability of any construction equipment around.

It's easy to see what that means to TORQMATIC users. Time after time, they're the outfits that land the

biggest, most profitable contracts — simply because they can do better, faster jobs for less.

And remember — TORQMATIC DRIVE is available in most types and makes of construction equipment. For the full story, see your equipment dealer or write:

Allison Division of General Motors, Indianapolis 6, Indiana
In Canada, GENERAL MOTORS DIESEL LIMITED, London, Ontario

Allison TORQMATIC
TORQMATIC® DRIVES
THE MODERN DRIVE FOR MODERN EQUIPMENT

G
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In the rugged mountain country of eastern California, U. S. Highway 40 twists and curves past the little towns of Colfax, Alta, Baxter and Emigrant Gap on its way east to Donner Pass. Tall pines, mud holes, boulders and patches of fresh snow cover the hillside. Cars and trucks hurry past; a long freight train rumbles by further up the mountain slope. Then ... a cold wet wind stirs the trees ... the earth grunts, shifts ... and ... **ROCK SLIDE!!!**

Giant mud slide blocks U.S. Highway 40. Traffic stopped until Michigan goes to work

4-yd Tractor Shovel clears huge boulders

Early last winter, 100,000 cubic yards of mud, rock and earth tore away from a mountain-top near Alta, Calif. The wave toppled trees and sucked up boulders—picked up speed as it tumbled down to Highway 40—dumping its load across the road shoulders and pavement.

To put ruffled nature back in place, the State of California, Division of Highways, called for bids. J. O. Archibald Company, general contractor from Redwood City, was awarded the job.

Archibald rushed his normal earth-moving fleet of scrapers, tractors, shovels and trucks to clear the highway, and to stabilize the hillside by terracing. But as they cleared away mud and rock, volcanic ash and sandstone, work crews came across giant boulders that required special treatment. Archibald didn't want to blast any more rock than necessary. Blasting would add to the cost of the project. Hoses and compressors would slow earthmoving. And any more vibration might set off another slide!

Special rock, special tool

So Archibald scanned his equipment roster, then selected a Tractor Shovel that in four passes was loading out 18 and 20 yard haul trucks. His machine—

a Michigan Model 275A—swung a big bucket, all right. Four yards. But big enough to handle the big rock? Say a boulder 10 feet in diameter?

It became Operator F. E. "Mac" McKinsey's job to find out. Mac had put in lots of time on Archibald's 2½-yd Michigans—also had clocked almost 200 hours on the new 4-yd Model 275A. But that was more-or-less straight truck-loading work. What could the 275A do halfway up a mountainside, working in treacherous, muddy footing, on steep slopes, moving boulders as required to a gully half a mile away?

Carries 8 tons, does 10

Under these conditions, the Michigan went to work. First, the operator edged Michigan's bucket lip under a typical giant boulder. Then, careful work of the hydraulic controls gently raised and tipped the bucket as operator felt his way under the huge rock. If the boulder could be lifted, more than likely it could be carried. And it was, load kept low—just off the ground.

So the job continued, the Michigan by itself moving a stream of 8 to 10 ton boulders to the dump area. Even when a rock was too big to see over, Michigan

carried it . . . the operator simply driving in reverse. Power steer and identical speeds forward and reverse made this easy. Other times, when boulders weighed over 10 or 11 tons, or when one was so odd-shaped it couldn't be carried in the bucket, the 262 hp Michigan simply *dozed* it the half mile to the edge of the gully.

Goes through muck, up mountain sides

"I felt like a hero on the job . . . sort of a King of the Hill," recalls Operator McKinsey. "Not only because of the huge rock and the fact that the Michigan eliminated blasting. But I ran up steep slopes with the Michigan that a six-wheel truck couldn't climb. I plowed right through mud that stopped crawler-tractors. I had the wonderful feeling of power—and I felt safe as I handled this big stone on that rough terrain."

Could the ability to handle 4 yds—lift up to 11 tons per pass—help solve *your* production problems? To help you judge for yourself, we'll be glad to show you a Model 275A in action. Or, if you prefer, to demonstrate to you any of seven other Michigan Tractor Shovel models, 16 cubic feet to 6 cubic yards. Call to arrange time and place.

Typical boulder carried by Michigan.
Its weight, about nine tons.



Huge boulders, over 11 tons, were
dozed by Michigan to dump.



Michigan is a registered trademark of



CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 14, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

MICHIGAN SCRAPERS

*Two high-traction Model 210's
work through truck-stopping mud,
cut costs more than 50%*

It was raining. Again. George Schultz Construction Co officials, Galt, Ontario, looked at the area around their crusher. A muddy mess. Trucks were bogging down so frequently the 2½ mile base course spreading job faced almost certain shutdown.

Then someone mentioned Michigan Scrapers. "Maybe these high-traction 19 yd rigs could continue work," he suggested. "Let's try them out." So contractors did.

Basically, operations were kept as before. Each of the two Michigans was crusher-loaded, and each hauled

- Their 19-yd capacity and high hauling speeds enabled the two scrapers to replace one 10 yd and six 6 yd dump trucks.



- Excellent spreading characteristics eliminated need for continual use of grader. Operator simply lowered cutting edge to within 4 to 5 inches of roadbed, opened apron, and ejected the gravel in a smooth, even "carpet."



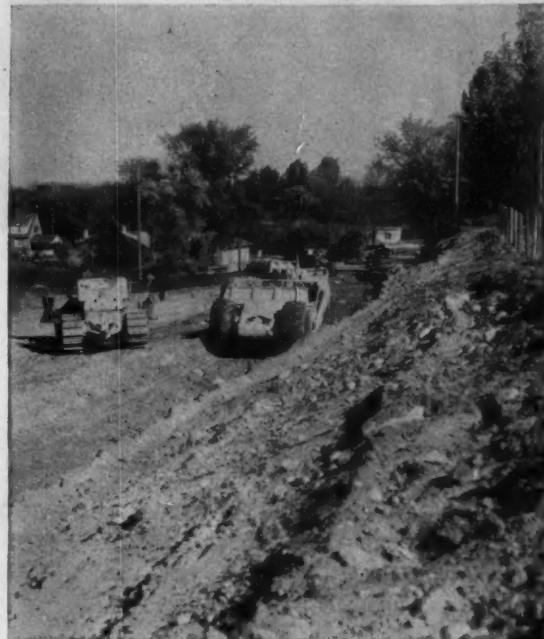
- Rolling action of low-pressure tires, plus 45,000 lbs empty weight, reduced number of roller passes necessary for compaction.
- With two machines able to do job normally requiring seven haul units, costs tumbled. Fuel consumption

direct to the right-of-way. But results were far different! Soft footing on route from crusher to highway hardly slowed the big-tired (29.5-25) 28 mph rigs. Savings ran over 50% and the job was completed well-ahead of schedule. The Michigans had presented half a dozen important advantages . . .

- Their ability to go through mud eliminated a push-tractor.

PREVENT SHUTDOWN

was lowered, fewer operators needed. Michigans together, on typical one-mile one-way haul, placed 40 to 50 loads, 720 to 900 bank yards, every 8 hour shift.



- Versatility of Michigans—handling dirtmoving and base course—enabled contractors to do entire 2½ mile road rebuilding job with the two scrapers, a pusher, and three dozers. No other machines were needed.

Good experience with Michigan Tractor Shovels led to try-out of Scrapers

Naturally, the Schultz organization is enthusiastic about Michigan Scrapers—just as they thought they would be. Because a prime reason for buying Michigan Scrapers was the company's good experience with their two Michigan Tractor Shovels. The rugged dependability and all-around capacity for hard work of these units had convinced Schultz the Michigan name on a machine meant a machine that could "take it." *And, after all, the Michigan Scraper had the same all-Clark power train design proved so successful in 11,000 Michigan Tractor Shovels.*

Michigan Scrapers should produce major economies, reasoned Owner George Schultz—and they did! Both in hauling base course, and on production work. (On



dirtmoving portion of this job, shown above, Michigans heaped 14 pay yds in 30 seconds—sometimes in as little as 15 seconds—completed typical 2700 ft cycles in 3½ minutes—1800 ft cycles in 2½ minutes—moved, on the longer haul, over 400 pay yards per 50-minute hour).

Get a demonstration on your job

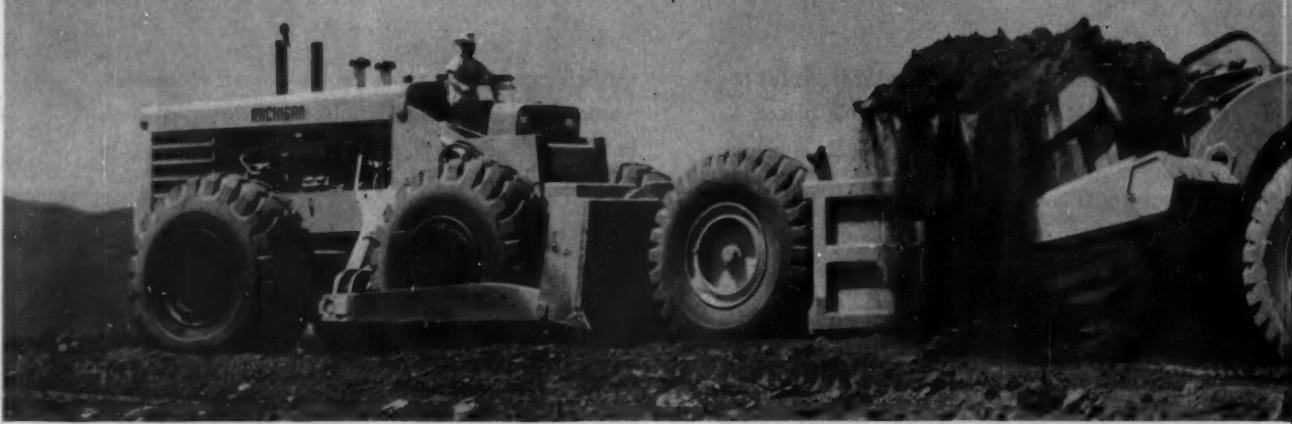
Investigate for yourself. We'll be glad to demonstrate this 19 yd—or our 10½ yd—or our 29 yd Michigan Scraper model on your job. Call us to arrange details.

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK
EQUIPMENT

2403 Pipestone Road
Benton Harbor 22, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario



COLORADO

In 30 seconds, Model 480's 600 hp regularly heaps 32-yd scraper to spill point. Machine owner: C. L. Huebner, Denver.

MICHIGAN DOZERS...4 sizes*

*MODEL 180—165 hp | *MODEL 280—262 hp | *MODEL 380—375 hp | *MODEL 480—600 h



CALIFORNIA

Sand fill at Oakland Airport has no effect on Model 380's tires yet it wore out crawler tracks in 6 weeks. Owner: Utah Construction Co, San Francisco.



FLORIDA

Maintenance costs dropped substantially when this Model 280 took place of crawler push-loading sand. Owner: Cone Bros, Tampa.



GEORGIA

Replacing crawler tandems with 600 hp Model 480 resulted in 14 more scraper loads per hour, 3.8 more yds per load, \$123 per hour additional profit. Owner: Hugh Steele Inc, College Park.

MICHIGAN
Fast 2-in-1
fill—load
shovel
Alley

OHIO
Tires
180 do
V. N.

F
ED



MINNESOTA

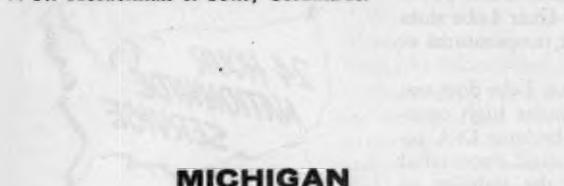
Fast 262 hp Model 280 handles *both* rock fill—360 loads, 5,000 yds per day—and shovel cleanup 3 miles away. Owner: Alley Construction Co., Faribault.

...*Job-proved coast to coast*



OHIO

Tires replaced by steel wheels, this Model 180 dozes and compacts clay fill. Owner: V. N. Holderman & Sons, Columbus.



MICHIGAN

High-speed Model 280 spreads more sand fill than big crawler it replaced, reduces maintenance, alone attains required compaction. Owner: Smith Bros., Cassopolis.

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KANSAS

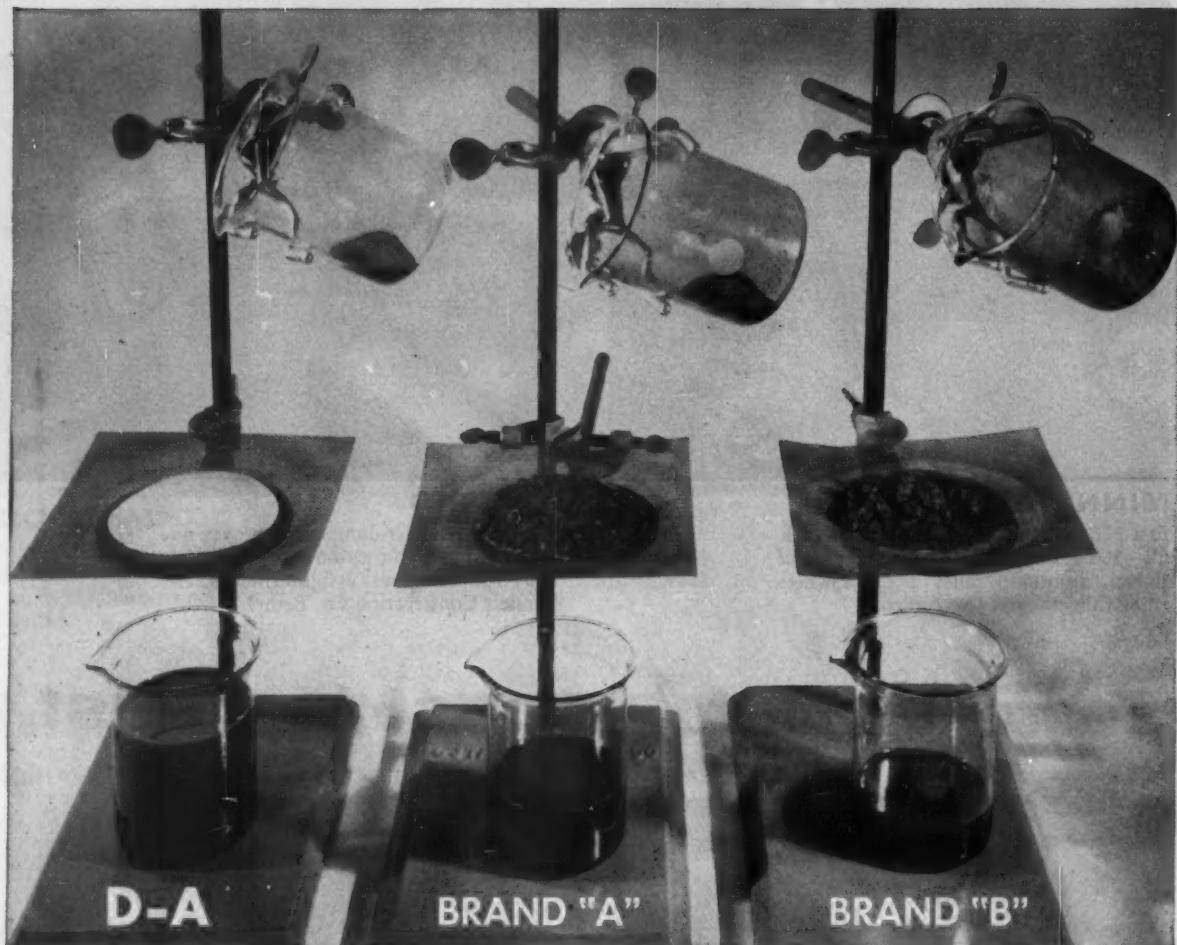
Wet, sticky hauler-dumped fill proves no problem for high-traction 375 hp Model 380 on Superhighway assignment. Owner: Bennett Construction Co., Bethel.



PENNSYLVANIA

Half-minute push of 375 hp Michigan Model 380 loads 25-yd pans in rocky soil. Owner: Latrobe Construction Co., Latrobe.





Stop sludge, stop corrosion with D-A UNIVERSAL GEAR LUBE

The unretouched photograph above shows the results of a 24-hour accelerated oxidation or sludge test. On the right, two leading brands of gear lube are badly oxidized following the test while, on the left, D-A Universal Gear Lube remains clear, stable and capable of extended use.

Here's what this means to your operation: film strength is the element of a gear oil which prevents wear. To obtain high film strength, extreme pressure additives are placed in the lubricant. At a temperature of about 250° — often encountered in heavy-duty equipment operation — these additives can oxidize, as they

have in the competitive oils seen above. When this oxidation occurs, the oils become extremely corrosive and rapid wear results. Tests prove that D-A Universal Gear Lube does not corrode, even at temperatures as high as 300° F.

D-A Universal Gear Lube does not sludge or oxidize under high operating temperatures because D-A research has established successful means of retaining the stability of D-A's high-quality base oil while maintaining the high film strength necessary for extra-heavy-duty equipment operation. For greater protection of your equipment under heavy

load and high temperature conditions, specify D-A UNIVERSAL GEAR LUBE.



Lubricating heavy-duty equipment across the nation since 1919.

D-A LUBRICANT COMPANY, INC. • INDIANAPOLIS 23, IND.

Construction Methods

AND
EQUIPMENT

MAY, 1959

VOLUME 41 • NUMBER 5

HENRY T. PEREZ, Editor

Who's to Blame?

"I FEEL THAT IN THE PAST the loosely supervised method of handling bonding credit by some surety people has played no small part in our arriving at the dilemma the construction industry is in today, known as our profitless prosperity. I am speaking of the free hand that some surety agents have had in obligating their respective bonding companies in guaranteeing the performance of a construction contract by firms who were neither financially capable nor had the ability, the experience, or the organization to do the job that was called for."

So said James W. Cawdrey, president of the Associated General Contractors of America, in addressing the 17th annual meeting of the National Association of Surety Bond Producers last month. And his words were echoed by Harold A. Webster, vice-president of the National Electrical Contractors Association. Webster put it this way:

"The writing of a bond to a marginal or shaky, or over-extended contractor is something the bond company must avoid. The bonding companies owe that to the industry. Opportunities for reasonable profit in too many jobs these days are being destroyed by incompetent contractors whose only real qualification is that somebody is willing to bond them.

"There are instances where bonding companies have taken the initiative in developing joint ventures on large construction projects. Their prospective client lacked the capacity to do the job so the bonding company brought in others, which it bonded as a joint venture, thus creating a competitor to perhaps several highly qualified firms capable from a financial and performance standpoint to do the job.

"In our industry we call the overpowering allure of a contract a disease—Contract Fever. Perhaps there is a virus floating about known as Bond Fever. We need to inoculate ourselves against such things with continuing injections of prudence and restraint and a hard-headed, objective understanding of our business."

What are the consequences of helping incompetents get in over their heads? At the same meeting, Robert L. Roper, assistant secretary of the National Association of Credit Management, said:

"Individual records indicate overwhelmingly that the bulk of contractor defaults and construction failures occur mainly among new and inexperienced contractors who have entered the field since World War II and many within only the last three to five years. Such unqualified and inexperienced contractors seldom measure up to the qualifications and standards of their more experienced competitors.

"Since experienced and qualified contractors are forced to bid competitively against the inexperienced and unqualified, the standards of the entire construction industry are forced downward. Competent contractors are forced to lower their own bid prices to meet the prices of their marginal competition. Results are reflected both in performance and in the number of contractor defaults and failures, with losses all the way around. Everyone in the industry is to some extent to blame."

Six spreads of earthmoving equipment, scattered over a 9,000-acre site are moving 50,000 yd of dirt per day at Washington International Airport.



WAGONS ROLL—A Euclid loader—one of two on the job—heaps dirt into a Euclid Bottom-dump wagon. Another wagon waits in line behind it, ready to keep the loader busy.



THE BIG ONE—New LeTourneau double-bowl scraper is the king-pin of the earthmoving fleet. It works two 10-hr shifts a day, moving as much as 8,000 yd of material per shift.

Moving Dirt for the Jet Age

By WILLIAM MOONEY
Assistant Editor

DIRT IS FLYING near Chantilly, Va., where C. J. Langenfelder & Son is moving more than 50,000 yd of material per day for the new Washington International Airport, the first airfield in the U. S. designed from scratch for big jet planes.

The job calls for a total of 11,000,000 yd of excavation. To handle this tremendous volume, Langenfelder has brought in plenty of equipment. Scattered over the 9,000-acre site are more than 90 major pieces of equipment.

One of the earthmoving rigs on the job is the new 130-ton-capacity R. G. LeTourneau double-bowl scraper powered by eight electric motors—one at each wheel. The LeTourneau monster is getting a thorough job test, and it's proving that it can earn its keep when it's going steadily. But there are still some kinks to iron out.

Material at the site ranges from a loose dusty loam on top to a dense shale at the bottom of the deeper cuts. In between, a sticky red clay laced with decomposed shale predominates.

Three runways will cross the site. Two parallel 11,500-ft-long

runways—No. 1 and No. 2—run roughly north-south across the heart of the airport. Between them will be an airplane service area. A third somewhat shorter runway will run at an angle to the other two in a northwesterly direction. The runways are 150 ft wide. A 75-ft-wide taxiway runs alongside each runway.

Langenfelder is concentrating their efforts on the two main runways now, while the third is being cleared. They started work on Runway No. 2 when they opened up the job late last fall. Then, when cold weather froze the loose loamy soil in that area,



SCRAPERS CUT CLAY—A Michigan tractor push-loads a Euclid TS-24 twin-engine scraper. Earthmoving spreads are spaced at close intervals along the runway to keep hauls short.



BLASTING—Most of the shale on the job can be broken up by rooters or rippers, but a team of five drill rigs cuts out the dense shale near the bottom of one of the deep cuts.

they shifted to Runway No. 1, where the material is predominately shale. They hoped to be able to work through the winter in this material, but it froze when it was ripped up, and they had to shut down for about two months.

They started operations again when the ground began to thaw in March, and now they are going full blast. Most of the equipment is working on the first runway. A team of six DW20's is busy on Runway No. 2 placing fill on top of concrete drainage pipes.

The rest of the equipment is strung out along the first runway. Langenfelder believes in cutting the job up into short sections so that hauls will not exceed a few thousand feet. Fortunately, on this job, cuts and fills are distributed in a way that fits

into this plan. The site is a rolling field with hills and valleys undulating across it in more or less regular progression. So cut and fills are well balanced, and hauls are short. Most hauls range from 600 ft up to 2,000 ft.

Six Spreads Pace Job

The first spread of equipment at the end of Runway No. 1 is a Euclid loader cutting out material for a fleet of bottom-dumps. A similar spread is at work a short stretch down the runway. In between is a deep cut where a blasting operation is taking out some particularly dense shale.

The two loaders split a fleet of 20 Euclid bottom-dump wagons between them. The number on each spread varies according to how fast the loaders are digging. If one hits easy material, it gets enough wagons to keep going full tilt. Langenfelder likes to have a wagon waiting in line, set to go, behind the one being loaded.

Next in line on Runway No. 2 is a fleet of six Euclid TS-24 twin-engine scrapers. These powerful rigs bowl along the fill at speeds up to 35 mph. A pair of push-dozers—a Euclid TC-12 and an Allis-Chalmers HD-21—load the machines in the sticky red clay.

The next spread is a team of Caterpillar tractor-drawn scrapers that Langenfelder spots in areas where the hauls are less than 1,000 ft. They include one 35-yd model 461, and four 25-yd model 361 rigs.

Filling out the list of earthmoving equipment is the big 130-ton

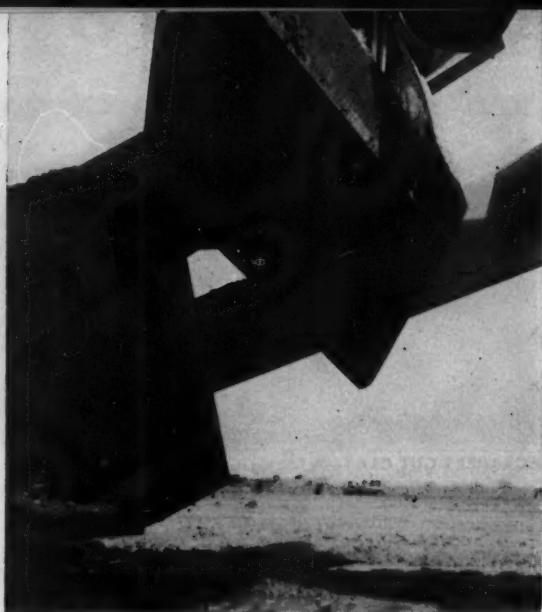


PAIR OF PUSHERS—Two push dozers—a Euclid TC-12 and a Caterpillar D9—handle a fleet of six Caterpillar DW20's on the first runway. Material here is mostly shale.

MOVING DIRT FOR JET AGE...continued



PLUGGING A GAP—Langenfelder modified the apron of the big LeTourneau rig by welding a triangular piece of steel plate to



its sides. The steel plate closes off the gap between bowl and apron, preventing material being loaded from spilling out onto cut.

LeTourneau rig. It's a spread in itself. The 100-ft-long leviathan is a big brother of the 60-ton model that got its first on-the-job test on a Texas road job (*CM&E*, Feb., p. 90).

Its bulk makes the rig seem deceptively slow as it lumbers back and forth between cut and fill. Actually its speed ranges from 12 to 16 mph. And when it's going steady it moves a lot of material. In one 10-hr shift recently the giant handled 8,000 yd. At that time it was hauling only 600 ft, making 10 round trips per hour.

R. G. LeTourneau Inc. says that the rig can handle 130 tons. The manufacturer feels that tonnage ratings give a better indication of a rig's capability than do the more common yardage figures. It depends on the material, then, as to how many yards the double bowls carry. The manufacturer claims that 95 to 100 yd is not an exorbitant figure for ordinary earth.

Goes Night and Day

To make money with the \$250,000 rig, Langenfelder has to keep it busy all the time. They work it two 10-hr shifts per day. Portable light plants illuminate the work area at night. (While the LeTourneau machine is grinding out yardage, the other rigs rest overnight. The contractor sees no necessity as yet for full-fleet night operation.)

But the mammoth scraper doesn't often roll for a full day without some trouble developing. Not too long after it started steady

work this spring, some of the electric motors that power each of the eight drive wheels burned out. LeTourneau replaced them with more heavily wound electric motors. They expect that these will cut down trouble. But first they have to synchronize them so that all the motors work together effectively. And this checking out of the new motors is taking some time.

It's not easy to pin down trouble when the big rig is acting up. The electrical system is basically simple, but there are a lot of places in the circuits where trouble can develop. And it takes time to trace the trouble to the spot that needs attention.

LeTourneau has a specially trained man on the job to cure the aches and pains that crop up periodically in the electrical guts of the machine.

Most of Langenfelder's veteran earthmoving men feel that the principle of electric drive is sound. It will take some time to get out all the bugs, but they look for the big rig to prove itself.

Big advantage of the LeTourneau rig, besides its big payload capacity, is that it is truly self-loading. Even in the sticky clay that abounds on this job, the big rig has never gotten hung up. The two 600-hp Cummins turbocharged diesels under the hood pack plenty of power.

Loading time for both bowls averages about 2 min. In tough going it may reach 4 min. The big rig won't get stuck, but when loading time gets that high Langenfelder looks for easier dig-

ging so that the giant will be moving dirt cheaply at a high production rate.

A single operator controls the rig from an instrument console. He loads the front bowl first. Because all of the machine's eight wheels are powered, the rear scraper acts as a pusher during this operation — which takes about 45 seconds on the average. Then he loads the rear bowl, which usually takes a little longer, although the weight of the load in front helps to increase traction.

The two bowls can be unloaded on the fill separately or at the same time. On the Chantilly job the operator dumps them one after the other to make a continuous strip of fill.

A Modification

After some experience with the rig, Langenfelder modified the apron to prevent material from boiling out between the apron and the bowl during loading. Originally, with the apron pulled down, there was a triangular gap between the apron and the bowl. As the bowl became full, material spilled out of the opening and formed a ridge along each side of the cut. This increased loading time and formed obstructing furrows along the cut area. So Langenfelder's shop crew welded a piece of steel plate to the apron and filled the gap.

Rounding out the earthmoving equipment on the job is an array of dozers, graders, and compactors. This small army includes more than 30 Caterpillar D8's,



ROLLERS STIR UP DUST—A sheepfoot roller and two Ferguson 50-ton rubber-tired rollers—some of the more than 30 pieces of com-

paction equipment on the job—roll the fill on Runway No. 1. Four water trucks help keep down the clouds of dust that cover the site.

nine D9's and three Allis-Chalmers HD-21's plus 10 motor patrols, and four front-end loaders. Compaction equipment includes four Buffalo-Springfield Kompactors, three Essick vibratory rollers, seven 50-ton Ferguson rubber-tired rollers, and 19 sheepfoot rollers.

The job is very dusty. The loamy topsoil blows away in thick clouds without its protecting cover of grass and weeds. To help keep the dust down, Langenfelder has four water trucks. One is a 2,800-gal Mack; the others are converted Euclid bottom-dumps with capacities of 3,300 gal.

About 40% of the material on the job is rock. Most of it is partially decomposed shale that can be broken up with rooters or rippers. But there are some spots in the deeper cuts that require blasting to loosen the shale.

Drill Rigs Team Up

A big Ingersoll-Rand Drillmaster heads the team of five drill rigs on the job. Other rigs include two Gardner-Denver Airtrac with companion compressors, and two contractor-built, tractor-mounted drills. Each of these rigs has two drills on hydraulic booms mounted on a Caterpillar D8, with a 600-cfm Ingersoll-Rand compressor at the rear.

The rigs drill 2½-in. holes spaced at 12x15-ft intervals in a staggered pattern. Depth of the holes varies from about 12 to 18 ft. Langenfelder is using ammonium nitrate cased in waterproof sacks with DuPont's Nilite prill.



JOB-BUILT RIGS—Hydraulic drills mounted on two Caterpillar D8 tractors drill holes in dense shale. Ingersoll-Rand 600-cfm compressors mounted at rear of dozers supply air.

An average shot takes out about 5,000 yd. The contractor has cut down on powder costs by limiting powder use to $\frac{1}{2}$ lb per cu yd of rock. They started out with three times as much, but gradually reduced the powder in each shot until they reached this minimum.

Langenfelder is aiming to complete their \$19 million in contracts by the fall of 1960. The contracts include clearing, grading, drainage, and paving. The contractor expects to start paving this summer. The two parallel north-south runways will be completed first. The third runway has a later completion date.

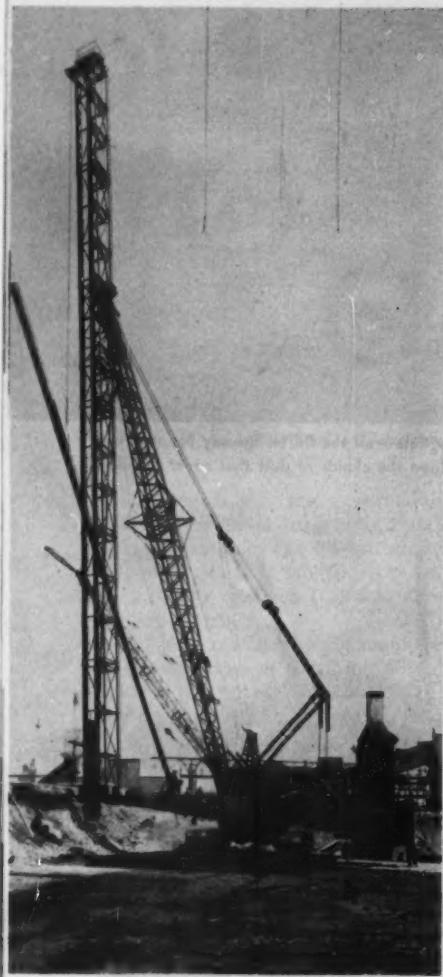
Located about 28 miles southwest of Washington, D.C., in a farming region, the airport is the

first installation to be designed entirely from scratch for jet service.

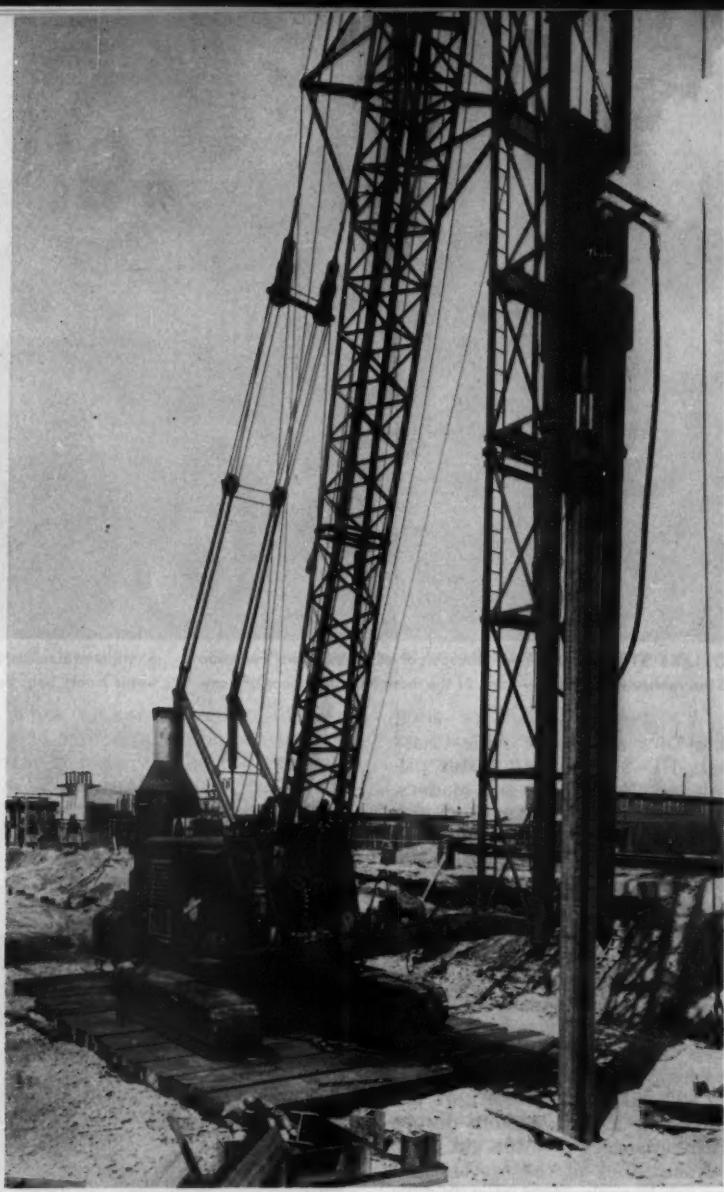
Men on the Job

In charge at the site for Langenfelder is project manager Bill Hazlehurst. B. G. Woolfolk is general superintendent. Sam Marshall is field superintendent. Serving as his assistants in the field are Lee Warfield and Bill Chappelle. Project engineer is Bill Gable. Heading the office staff is John Huntley.

Ammann & Whitney, a New York consulting firm, is supervising construction of the project for the Federal Aviation Agency. Resident engineer is S. R. Ransome.



INTO LEADS—Weighing close to 9 tons, 140-ft pile swings into place.



INTO THE GROUND—An extra-large hammer, a Vulcan ORR with a 37,375-ft-lb ram, drives the long pile home. A protective bar keeps hammer's steam inlet pipe from damage.

Tubular Leads on Big Crane

So he can drive 145-ft piles in one piece, a contractor built a towering set of leads from pipe. And for faster splicing of the long H-sections from shorter lengths, he set up roller jigs that permit all welding to be done downhand.

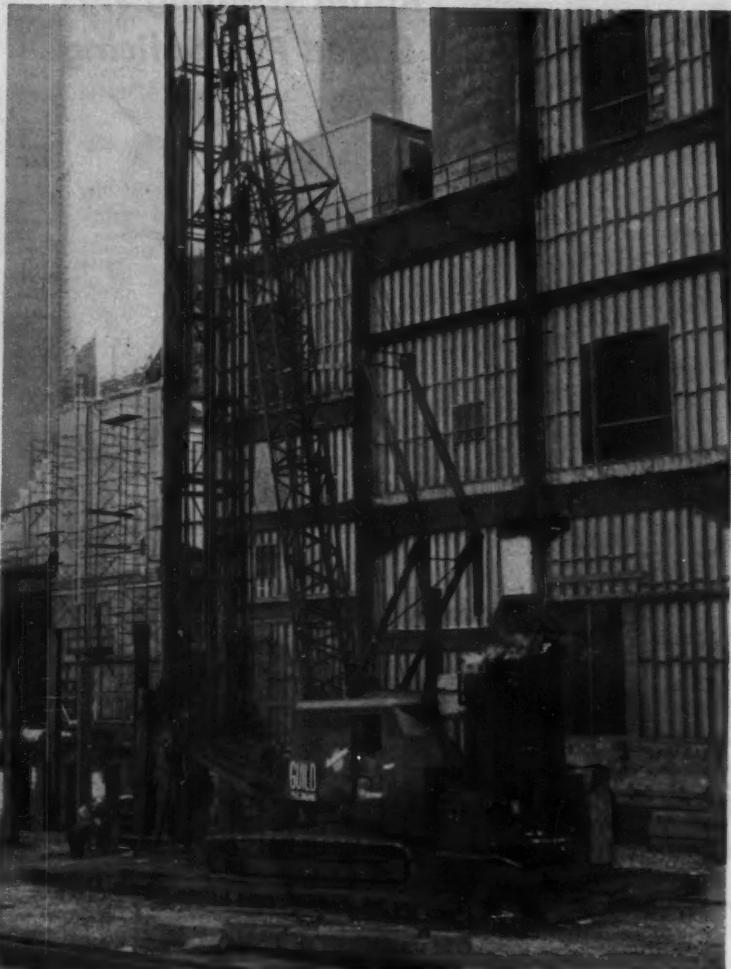
TO DRIVE LONG PILES in one piece you need tall leads, obviously. But this extra height poses a problem: Snaking a long, heavy pile into the leads puts severe side stress on them, so they must be extra strong. At the same time, they must be light enough so as not to overload the crane that carries them.

So, faced with the job of driving 145-ft-long steel H-piles weighing 9 tons each, an East Providence, R.I., contractor built a set of sectional leads from pipe.

This gave him a high strength-to-weight ratio. And by flanging the joints between the lead sections, he achieved the necessary stiffness to take side thrust.

Powerhouse Job

The contractor, who also set up a roller jig for all-downhand welding of pile splices, is C. L. Guild Construction Co. The job involved is an addition to a power station of an east coast utility. As a sub to Thomas O'Connor & Co., Cambridge general contrac-



ONTO THE CRANE—Contractor added 100-hp boiler and fuel and water tanks to the big Manitowoc 3900 that handles piledriving. The heavy, wide-base rig rides on timber mats.

Handle Long Piles

tor, Guild is driving 14-in. 117-lb BP sections—574 of them—averaging 140 ft in length.

Piles are driven by a Vulcan ORR hammer whose 11,500-lb ram develops 37,375 ft lb per blow. A 100-hp oil-fired boiler on the rear of a wide-base Manitowoc 3900 crane furnishes steam to the hammer.

The crane carries a 95-ft boom. Near its midpoint, the boom is fitted with a yoke frame over which cables pass to anchor-fitments at boom tip and boom heel.

This assembly acts as sway bracing to give the boom additional rigidity for handling Guild's 144-ft tubular leads.

Guild built his leads in 16-ft sections. Vertical members at the two rear corners of the leads are 4-in. X-heavy pipe. Verticals at the front corners are 10½-in. OD pipe with a 0.217-in. wall thickness. Welded to these are hammer guide rails of 1x2½-in. steel plate. Distance between front and rear members of the leads is 47 in.

Near the ends and third-points

of each 16-ft section, the verticals are horizontally braced by welded 5x5x½-in. angles. Diagonal bracing in the rear and side panels of the leads is all welded 2-in. standard pipe.

Welded to the top and bottom of each section's vertical corner members are steel flanges stiffened by gussets of ½-in. plate. Flanges of the 4-in. verticals are 8½ in. in dia and have four holes. The 10½-in. main verticals are fitted with six-hole 15-in. flanges. One-inch bolts through the flange holes hold adjacent 16-ft sections of leads rigidly together.

For the long-pile job, Guild assembled the sections to make 144 ft of leads. The leads are pinned to the boom about 90 ft. from the bottom. The bottom is held to the crane by an 18-ft telescopic spider, or A-frame, that can be extended to 30 ft. Two Ingersoll-Rand air-tuggers, operated by steam, sit in the A-frame. Cables from one tugger adjust the length of the A-frame. A cable from the other handles a steam-driven Williams rotary 24-in. auger that Guild mounted in its own frame on the right outside face of the leads.

Drive in Clay

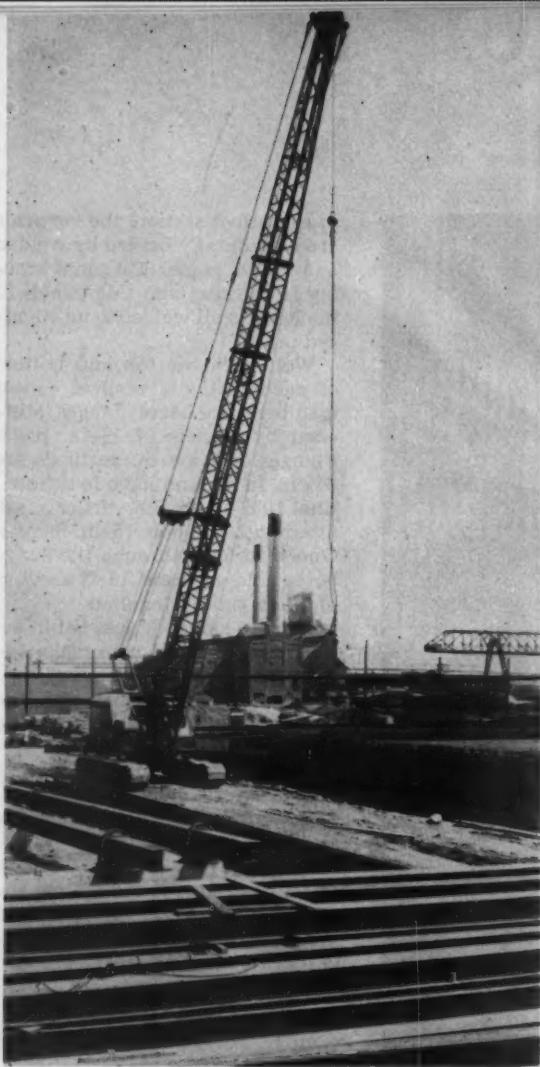
Reason for the auger is two-fold. First, material over bedrock at the powerhouse is generally a soft clay. But it is topped by a layer of stiff clay near ground surface. The auger pre-bores 25-ft-deep holes for the piles through the stiff material. If this were not done, a clay plug would form at the pile tip between the flanges. This plug, in effect, would transform the pile from an H section into a square section, with resultant increased driving resistance through the soft clay below.

Second reason for the auger is that placing the long piles in a pre-bored hole makes it easier to get them under the hammer in the leads. Once the pile is positioned, the hammer drives it to rock or refusal, which is 20 blows per inch with the extra-powerful ram. Progress averages approximately six 140-ft piles in 8 hr.

But driving the long piles in one piece is not the only unusual part of Guild's job. First he has to splice them from shorter lengths.

continued on next page

TUBULAR LEADS FOR LONG PILES . . . continued



YARD CRANE—A Lima 604 serves the pile yard, setting 60 to 85-ft lengths in the jigs and removing the completed 140-ft piles.

Roller Welding Jigs Speed Pile Splicing



WELDING YARD—Near the driving site, two two-man welding crews splice two piles simultaneously. Jigs hold the piles straight.



SPLICING—The strong splice calls for a full-section, one-bevel butt weld and three fillet-welded 10x10x $\frac{3}{8}$ -in. splice plates.



WELDING—Paired welders attack the splice with P&H 1/2x18-in. AWS E6020 rods. Four welding machines supply 1,400 amps to job.

The 14BP117 sections are delivered to the job in 60 to 85-ft lengths. Two of these are welded together to make a pile. The splice includes a full-section, one-bevel butt weld and three fillet-welded splice plates. Splice plates, 10 in. square and $\frac{1}{8}$ in. thick, go on outside flanges and on one side of the pile web.

Splicing takes place in a roller jig that puts the pile at a convenient height for welding and which rotates so all welding can be done downhand. The jig consists of a series of six circular clamps that fit around two butted pile sections to hold them for joining. The clamps are in two semicircular halves so that the

upper piece can be unpinned and taken off during placement or removal of a pile.

Sets of roller bearings cradle the circular clamps. And fittings that hold the bearings' shafts are anchored to concrete piers. Each pier supports two sets of jig fixtures so two piles can each be spliced simultaneously.

Piers are located near the center and ends of the two sections to be joined into a pile. And the circular clamps on the piers near the splice are fitted with a toothed ring that meshes with a smaller gear on the jig fixture. Turning the gear with a ratchet wrench rotates the clamp and the pile section it holds.

A Lima 604 crane with 60-ft boom serves Guild's pile yard. First it places pile sections, whose splice ends have previously been beveled, into the opened jig. With splice ends butted, the top halves of the circular clamps are replaced and pinned.

Exact Fit-Up

Then a two-man welding team fits-up the joint to match exactly, so that the completed pile will be truly straight for proper driving. Because of mill tolerances of the delivered sections, this sometimes is quite a job. But with C-clamps, wedges, and hydraulic jacks, the crew always gets them in perfect alignment before welding.

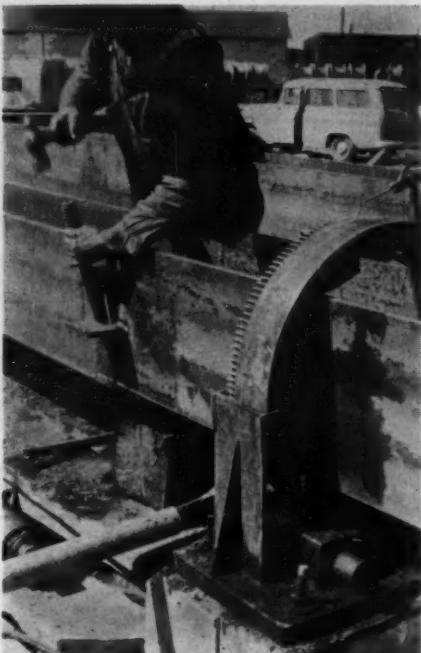
Preparation for splicing takes about $\frac{3}{4}$ hr; welding takes somewhat longer. But the yard's four weldors complete an average of seven piles in an 8-hr day. Welding sequence, with the pile rotated 90 deg between each step so that welding is always downhand, is: (1) web splice plate, (2) splice plate on one flange and butt weld of other flange, (3) web butt weld, and (4) splice plate on second flange and butt weld of first.

Two weldors simultaneously attack a splice, using $\frac{1}{4} \times 18$ -in. P&H rods with an AWS classification of E6020. Each weld requires four passes. Current for the operation comes from a bank of four welding machines; two 300-amp Westinghouse, one 300-amp Hobart, and a 500-amp Lincoln. These also serve another two-man weldor crew working on the splice of the pile in the second set of jig fixtures.

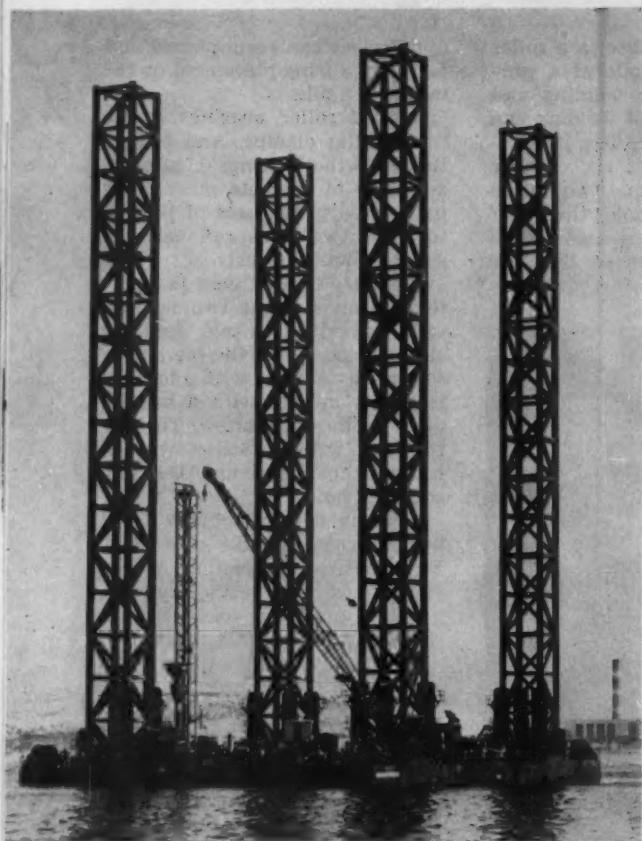
C. L. Guild Construction Co.'s Boston office, under the management of Roy M. Stifler, is handling the work.



FIT-UP—Clamps, wedges, and jacks help align the joint between the butted 14-in. 117-lb BP sections before welding, so pile will not wander off line while driving.

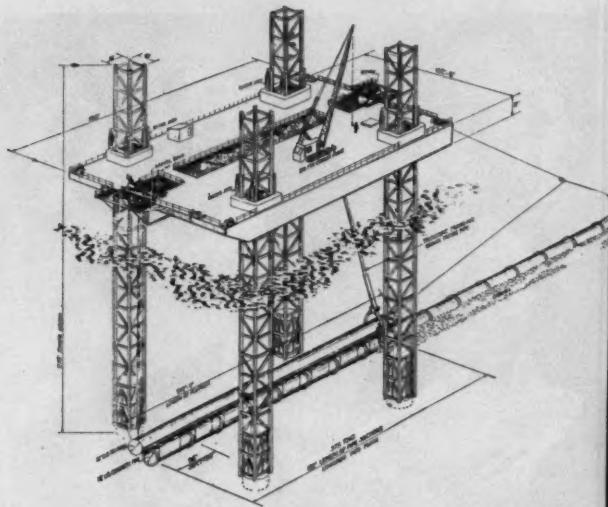


TURNING—Pumping ratchet wrenches, crew rotates the jig fixtures and the pile they hold. Turning the pile between welds lets all work be done in fast downhand position.



It's a Barge with Legs

With legs jacked up in the air, platform floats on its own hull (left). It sailed from San Francisco to Los Angeles like this. To lay pipe, the rig lowers its 275-ft legs until they sit on the bottom and the hull is above water level. Then it picks up a 192-ft length of pipeline and lowers it into position (right).



Rig Wades in Water 200 ft Deep To

To lay a 12-ft dia concrete pipe 5 mi out into the Pacific Ocean, the contractors developed a unique working platform that moves right along with the job. Costing \$5 million, the rig weighs 4,500 tons and stand on four massive legs that can be retracted to allow the hull to float.

A HUGE offshore work platform that "walks" in 200 ft of water is the key rig in one of the most ambitious ocean pipelaying jobs ever attempted.

The size of the rig allows the contractor to fabricate 12-ft ID concrete pipe on shore in 192-ft lengths. These sections are floated to the offshore site on pontoons. Then winches on the big platform lower the 680-ton pipe assemblies into place on the ocean floor.

The pipe is an effluent outfall from Los Angeles' Hyperion sewage treatment plant. It will extend 5 mi into the Pacific Ocean. A joint venture of six construction companies has a \$20.3-million contract to lay the pipe.

Partners in the joint venture

are Raymond International, Inc., of New York, DeLong Corp. of New York, Healy-Tibbitts Construction Co. of San Francisco, Peter Kiewit Sons' Co. of Omaha, Neb., Macco Corp. of Paramount, Calif., and Tavares Construction Co. of La Jolla, Calif.

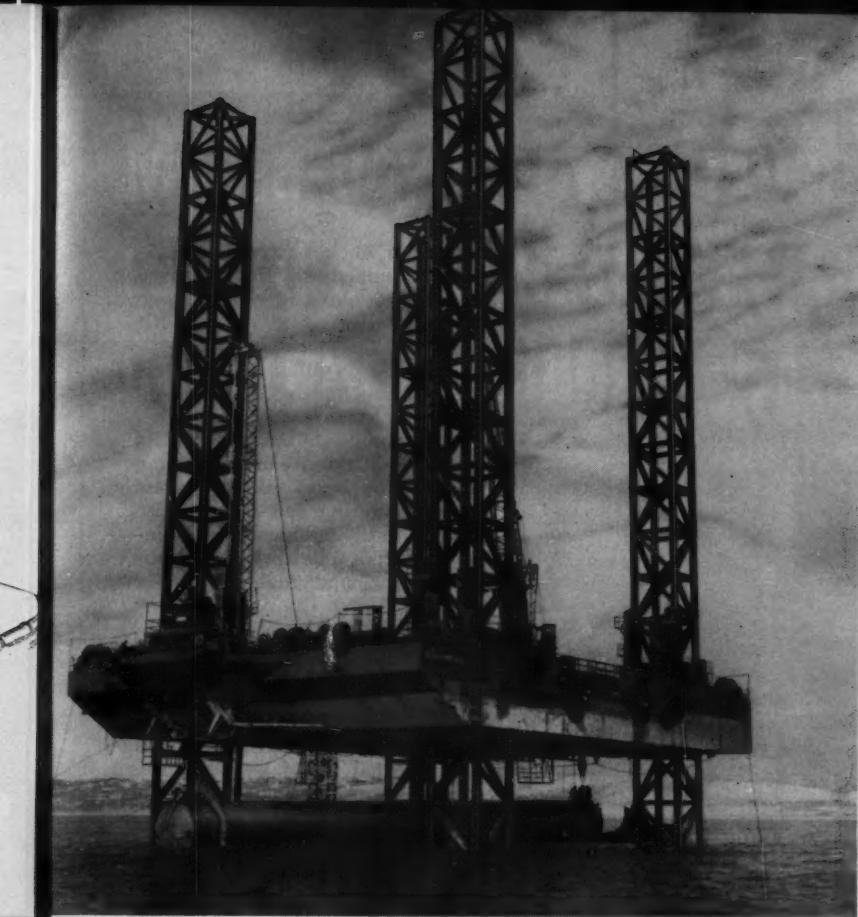
The contractors laid the first 3,700 ft of pipe in a trench from a temporary trestle built into the surf. The remaining 24,500 ft goes on the ocean floor and terminates in 200 ft of water. Most of the pipe has a 12-in.-thick wall and weighs about 3½ tons per lin. ft.

The unique offshore work platform is called the "George F. Ferris" after the president of Raymond International, sponsor of the joint venture. It is a 4,500-ton,

four-legged platform designed on the principle of the "Texas Tower."

To lay a section of pipe, the platform first floats itself into position, guided by anchors and platform-mounted winches. Jacks lift the platform onto its 275-ft legs and raise it to a working position well above water level. The pipe-pontoon unit moves in under the platform. Then the platform lowers the pipe to the bottom where it is seated into the previously placed pipe. A special tremie and hopper arrangement on the platform backfills gravel around the pipe after which the pontoon is released.

To move forward, the platform lowers itself again on its legs un-



To Lay Offshore Pipe

til the entire unit is floating. Then it winches itself to the next position and repeats the process. About 170 such moves will be required to complete the pipeline.

Platform Details

The hull, or working platform, is 190 ft long, 122 ft wide, and 17 ft deep. It is divided into a number of watertight compartments. Wells near the corners accommodate the four legs and five other wells spaced along the centerline of the platform contain the gravel hoppers.

A pair of steel truss outriggers project beyond the bow and stern. The bridge cranes that handle the pipe ride on these outriggers. Each crane can travel 12 ft longitudinally and 6 ft transversely. This is enough tolerance for the crane to position itself exactly above the pipe centerline after theodolite-equipped surveyors on shore have positioned the platform.

The cranes mount 30-in.-dia, 6-sheave blocks that lower the pipe assemblies to the ocean floor and hold them suspended while they are jointed and backfilled.

The platform legs are 275 ft high and 17 ft square. Each weighs 700 tons. Of box frame construction, they consist of four 14WF426 corner beams strengthened with flange plates nearly 4 in. thick and cross-braced with 14-in. steel H-sections.

Large pontoons fitted into the base of the legs serve two functions. They reduce leg weight to simplify jacking and they provide a broad flat shoe to make contact with the ocean floor.

To accommodate horizontal pin jacks that help raise and lower each leg, 10x12-in. notches were cut into the 4-in. flange plates on three of the corner columns on each leg. These notches had to be cut to a 1/16-in. tolerance to insure precise balance during the jacking operation.

The jacks raise or lower the legs at a rate of 1 ft per min. Automatic controls keep the three jacks on each leg working together. One operator handles all the jacking from a central control room.

The jack assembly on each leg consists of two horizontal pin jacks that engage the notches in the flanges of the legs and a single vertical jack that does the lifting. Only one pin jack is engaged at a time.

When the bottom pin is in a notch, the vertical jack, which is framed to it, lifts the tower leg. At the end of the lift stroke the top pin jack is inserted into a flange notch to anchor the leg while the lower pin is retracted. The vertical jack then lifts the lower pin jack to the next position, and the cycle is repeated.

Fifteen Denison electrically driven pumps operate the jacks. They operate at 35 gpm and 5,000 psi.

Barge Moving

Seven-air-powered deck winches position and advance the platform. Four of them, located at the corners of the platform, handle side anchors. Two others handle bow and stern anchors. The seventh winch hauls in the outfall pipe with a line reeved through an anchor sheave.

All the winches have a 36-in.-dia drum and 51-in. face equipped with a winding device for 1 1/4-in. wire rope. Pneumatic power for the winches comes from a battery of four 600-cfm compressors skid-mounted on the starboard deck alongside a small office building.

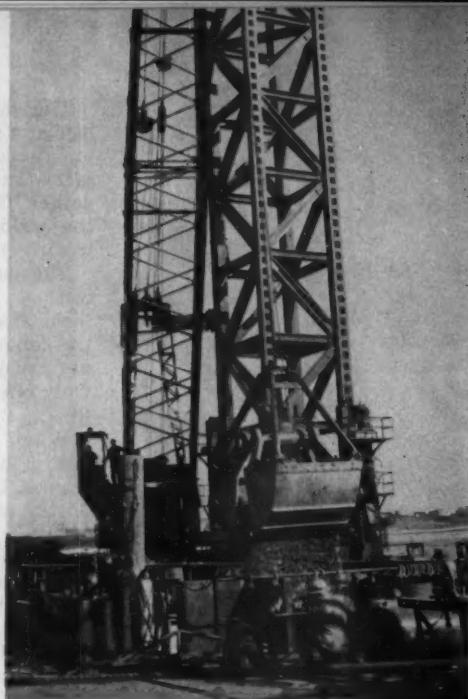
Also mounted on deck are two 4-drum car pullers. One handles transverse positioning of the pipe; the other pulls a gravel hopper and a pair of chutes back and forth along the pontoon. Both pullers run pairs of lines off the bow and stern ends of the platform down to the pontoon.

Tremie Backfill

A telescopic tremie pipe, riding underneath the platform, handles gravel backfilling of the pipe trench. Five hoppers on the platform, with a total capacity of 1,400 tons, feed material into the tremie. Each hopper has two discharge gates. A catwalk under the hopper gates allows workmen to control the gates manually. When not in use, the tremie is slung under the platform.

A Manitowoc 4500 crane with

Work Platform Lays Pipe, Places Backfill, Then Moves On



PLACING GRAVEL—Manitowoc 4500 crane with clamshell bucket transfers gravel from barge alongside to one of five hoppers on the deck of work platform.



JACK DETAILS—A set of three jacks on three of the four corners of each leg raise platform. Middle jack does the lifting; pin jacks fit notches in leg.

LOWER LEVEL—Catwalk under platform allows man to control hatch openings for gravel. Outrigger (left) carries bridge crane that lowers pipe assembly.



clamshell bucket rides the platform to unload gravel from barges moored alongside. The crane also handles other heavy-lift chores on the platform.

Three Caterpillar D397 diesel-electric sets located in the hold supply electric power for all lighting and equipment. Each set has a rated capacity of 350 kw and is cooled by Ross heat exchangers and circulating sea water. Also housed in the hold are two air receiver tanks, a battery of hydraulic pumps, and fuel and water pumps.

To maintain the balance of the platform, the four watertight wing compartments serve as salt water ballast tanks. Two Peerless pumps supply 600 gpm of sea water at 100-ft head to these tanks. An internal piping system shifts ballast from one tank to another as needed.

Other watertight compartments serve as tanks for storing diesel oil, salt water, and potable water.

DeLong Corp. developed the floating platform especially for this job. A group of San Francisco Bay area firms fabricated it; Pacific Coast Engineering Co. made the hull, Kaiser Steel Co. fabricated the legs, and Yuba Manufacturing Co. made the jacks.

Assembling the platform was a major job. Maritime and Precast Concrete Corp. handled it. During the leg assembly, an A-frame type shear leg mounted on the deck of the platform handled lifts of as much as 170 tons.

Moving the platform from the assembly point in Richmond, Calif., to Los Angeles was another spectacular operation. It involved a tight squeeze to get under the Golden Gate Bridge and then a five day trip down the California coast.

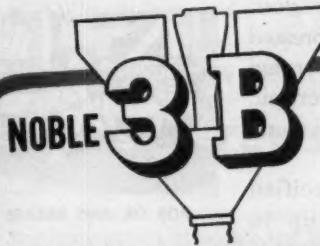
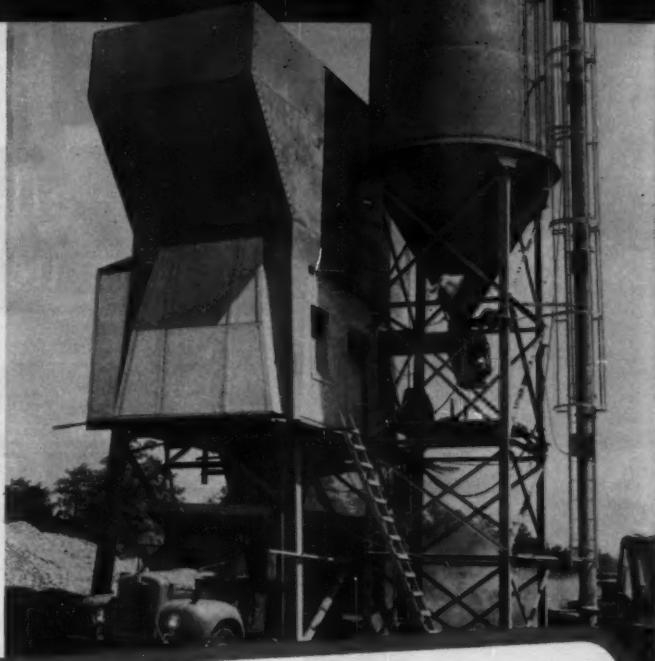
The rig cost about \$5 million. It probably will have resale value for offshore drilling or other similar work.

The rig is working very well, even though the job is some months behind schedule. Most of the delay occurred in the fabrication of the platform. Pipelaying now is down to a routine, and the contractors are installing up to five 192-ft pipe assemblies per week.

continued on page 101

Mile-a-day highway paving record set with NOBLE 3B concrete batching plant

5,394 feet of highway paving setting a new 1-day record was supplied entirely by NOBLE 3B concrete batching plant. Two dual drum pavers pouring concrete every 30 seconds on relocation of Rhode Island Routes 2 and 3 depended on an uninterrupted flow of aggregates and cement. The 1150 batches required were batched and discharged by NOBLE 3B on schedule without a hitch! With overhead aggregate storage of 150 tons and separate overhead cement storage of 500 barrels, NOBLE 3B high speed output kept 8 dry batch trucks hauling materials in a steady stream to the paving site 7 miles away. Of all batching plants familiar to the contractor, **Campanella & Cardi**, in its ready-mix concrete division, NOBLE 3B was selected for highest productivity, consistent quality and reliable, economical operation.



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CASTING YARD—Subcontractor casts, cures, and stores hundreds of 24-ft lengths in his yard near the shore end of the job. Wall

thickness of the pipe is 12 in., and each section of the 12-ft ID tube weighs about 85 tons. At left, two are pressure tested.

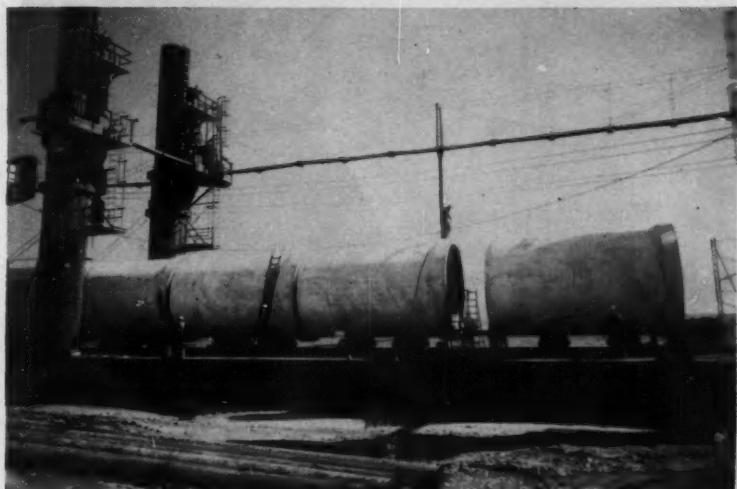
LAYING OFFSHORE PIPE . . . continued

Shore Crews Assemble 192-ft Units

To speed offshore operations, the contractors assemble the 24-ft long concrete pipe sections into 192-ft long units on shore. They sling each unit underneath a 212-ft long pontoon and float it to the offshore site.

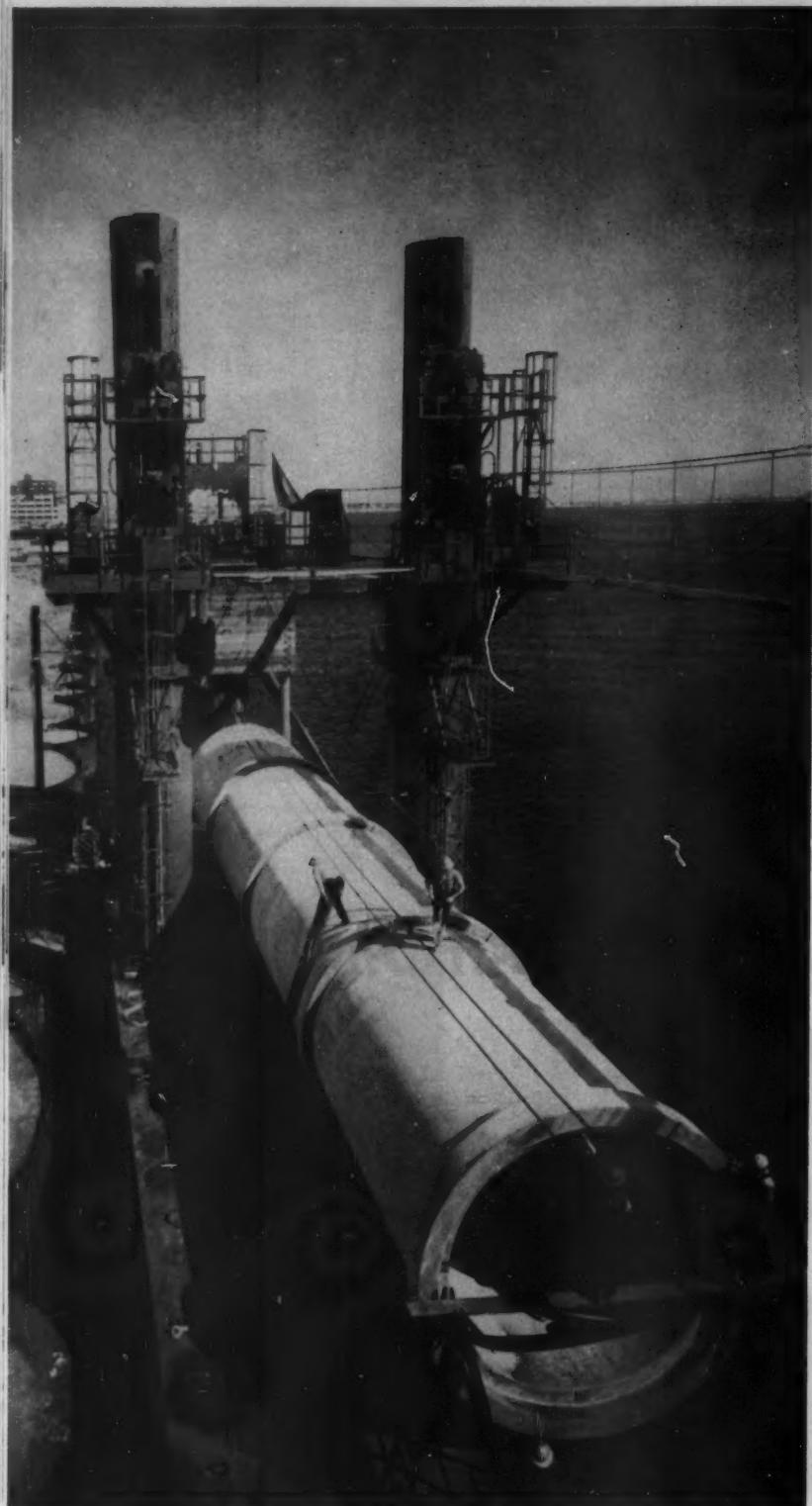
The work platform, guided by the surveyors on shore, drops anchor and winches itself into position. It lowers its legs and jacks itself up into working position. A haul-in line from a stern winch pulls the pontoon unit under the platform.

Lines from the winches on the bridge cranes fore and aft of the platform are connected to hooks at either end of the pontoon. These lines lower the pipe. Another group of winch-operated lines, connected to both ends of the pontoon, handles lateral posi-



TUBE ASSEMBLY—Crew links up pipe sections on floating drydock. Dollies riding rails along dock's deck move eight sections, one by one, into position for joining.

Pontoon Moves Pipe to Sea



DRYDOCK—Pipe is assembled on dry dock beside shore casting yard. Jacks on the tower legs will submerge deck and pipe so pontoon can be floated in on top of pipe.



ATTACHING THE PONTOON — Cable slings connect pipe to bottom of pontoon.

tioning. Hoses connected to the pontoon compartments control ballast.

To sink the pipe, the pontoon is partly filled with water until it has a negative buoyancy. Then the winches lower it until the pipe is within 1 ft of the ocean floor.

Divers check the position of the pipe and signal for the haul-in line to make the joint with the previously laid section. In deep water, underwater television will aid this control and inspection work.

With the pipe still suspended off the bottom, the tremie pipe is lowered from underneath the platform. It connects with the hopper that rides the pontoon. Winches pull the hopper back and forth along the pipe, and the pair of straddling chutes deposits a cradle of gravel underneath the pipe and halfway up the sides.

When the pipe is seated on the gravel, hydraulic rams move rods along each side of the pontoon to disconnect the cable slings holding the pipe to the pontoon.

Just before the slings are disconnected, more water is pumped into the pontoon to prevent it from popping to the surface. A



Slings are designed so that hydraulic rams on platform can release them under water.

special electronic device continually signals the amount of negative buoyancy, and the pumps operate accordingly to keep the buoyancy at a level where the pontoon can be handled easily.

After the pontoon is pulled to the surface, it is towed back to dry dock on shore where it picks up another pipe assembly. The work platform lowers itself to the water, jacks its legs off the ocean floor until the hull is floating, and winches itself forward.

Shore Assembly

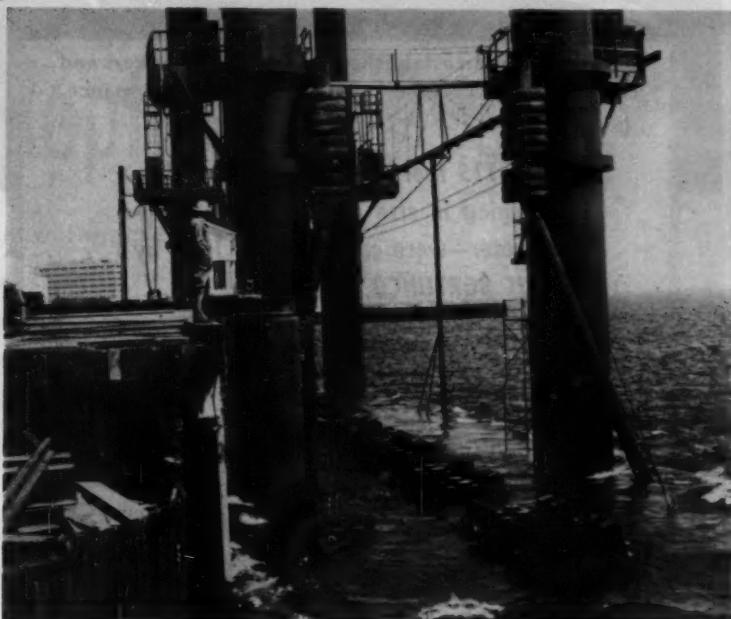
United Concrete Pipe Corp., a subcontractor to the joint venture, casts the pipe in 24-ft lengths in a waterfront yard in Long Beach, 20 mi from the site. Eight of these sections are assembled into a 192-ft string in a DeLong self-elevating dry dock.

A crane swings the 85-ton sections onto wheel-mounted cradles or dollies in the dry dock where they are jointed together by conventional methods. Then the dry dock submerges by jacking itself down onto its steel legs so the pontoon can be floated in on top of the submerged pipe.

continued on page 104



FLOATING THE PONTOON—Launch prepares to tow pontoon and pipe out of dock. To refloat pontoon, the dry dock submerged, after the pipe and pontoon had been connected.



STARTING AGAIN—Dry dock rises to surface again after pontoon has been towed out. It now is ready for a new assembly. Dollies on rails are for moving pipe sections.



OFF TO SEA—Tugboat tows completed pipe unit and pontoon 20 mi to offshore job site. After this section of pipe has been laid, the pontoon will return to pick up another.



INSHORE PHASE—Gantry crane rides trestle to place pipe on shore end of job.

LAYING OFFSHORE PIPE . . .

The dry dock surfaces and the pontoon is lashed to the pipe. Finally the entire assembly submerges again, and the buoyant pontoon-pipe assembly is towed to sea.

Inshore Section

The 3,700-ft section of the pipe from the high tide line through the surf to water deep enough for the work platform required a different method of installation. A 100-ton gantry, operating on a

continued

temporary trestle, laid pipe in this area.

The gantry mounted two 3-drum electrically powered winches. Each truck of the gantry was individually powered by 24-hp electric motors. A diesel generator supplied direct current power.

Piles for the inshore section of the trestle were untreated timber piles; 16 and 18-in.-dia steel pipe piles were used in the offshore section. Rails, spaced 21½ ft apart, carried the gantry and other heavy equipment along the trestle.

The first 1,200 ft of the pipe through the surf area was laid between protective sheetpile walls. This part was completely back-filled. The rest of the trestle-laid pipe went in a trench with part of the pipe extending above the ocean bottom. Some of the pipe laid by the floating platform also went into a shallow trench, but most of the outer part of the pipeline lies directly on the ocean bottom; currents are not expected to provide much scouring action in deeper water.

Pumped Backfill

In the trestle area a crane with clamshell bucket excavated the trench. A special, track-mounted rig, fed by the crane, handled the backfilling. The rig scalped out material over 6 in. and pumped the rest from 700 to 1,000 ft for backfill. It mounted a 10-in. dredge pump; water was provided by deep well turbine pumps.

To lay the pipe, the gantry straddled a section of the pipe on a work platform. It picked up the pipe, traveled to the placing position and lowered it into position. Joints were made by tightening a pair of 1½-in.-dia holding bolts positioned 3 ft above the spring line.

The pipeline is part of a \$60-million bond-financed program by the Los Angeles Board of Public Works that will increase the capacity of the Hyperion Sewage Treatment Plant from 245 mgd to 420 mgd.

Arthur Fertell is project manager for Hyperion Constructors. George Bauer is offshore superintendent in charge of the floating platform operations. J. M. Christensen was superintendent of the trestle section of the job.

Rear Admiral Cushing Phillips CEC USN (ret) is president of the Los Angeles Board of Public Works.

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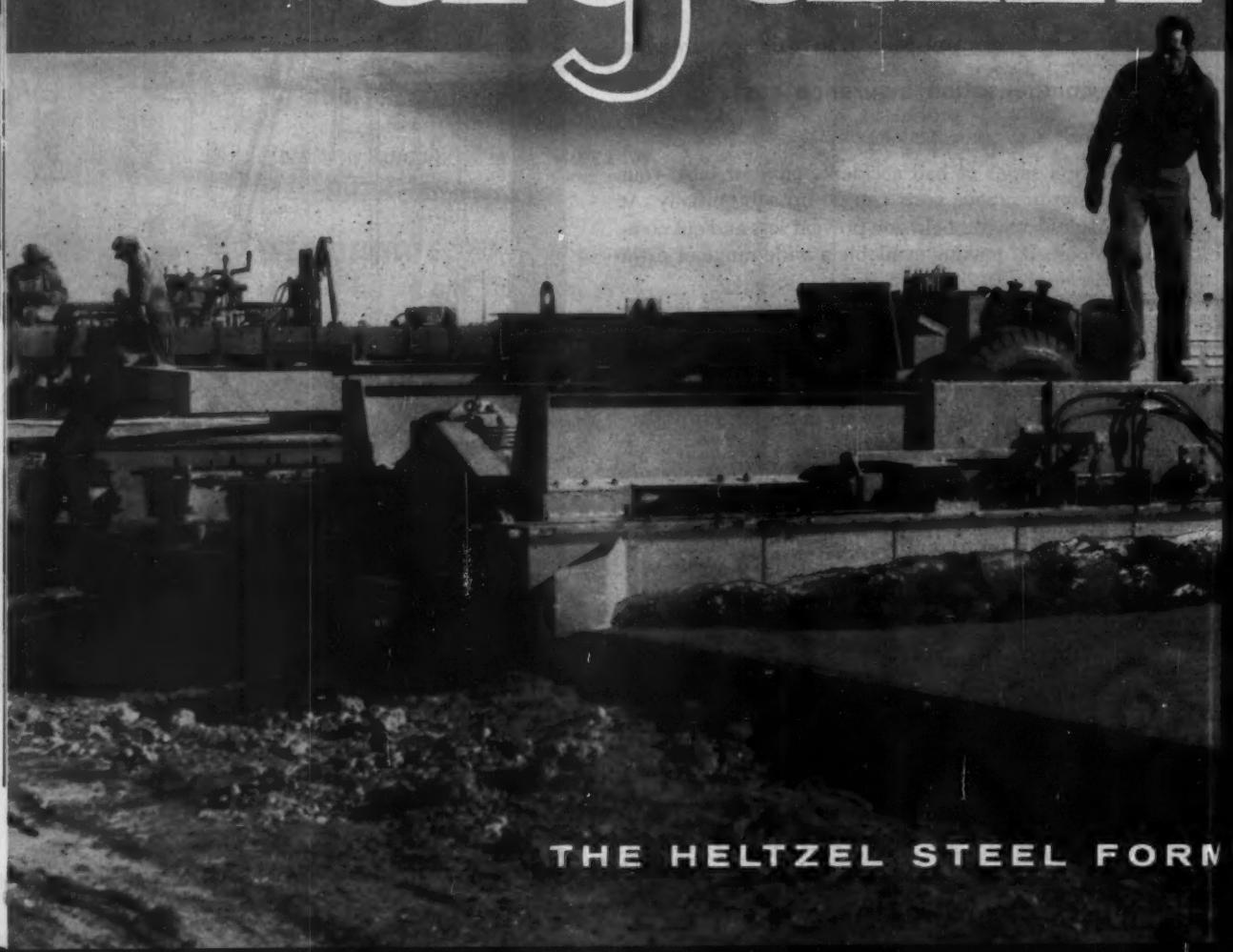
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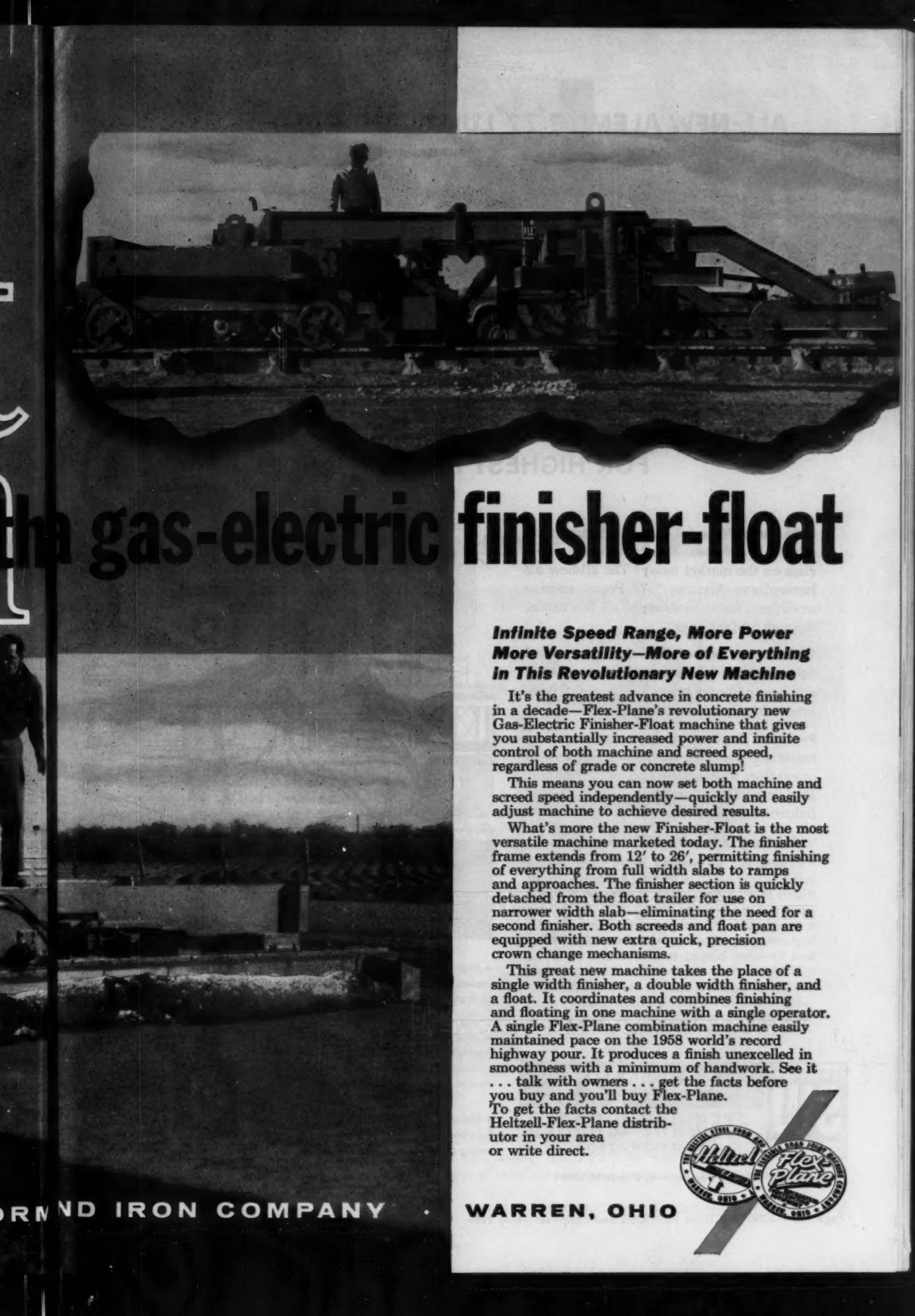
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FLEX-PLANES first again



THE HELTZEL STEEL FORM



the gas-electric finisher-float

**Infinite Speed Range, More Power
More Versatility—More of Everything
In This Revolutionary New Machine**

It's the greatest advance in concrete finishing in a decade—Flex-Plane's revolutionary new Gas-Electric Finisher-Float machine that gives you substantially increased power and infinite control of both machine and screed speed, regardless of grade or concrete slump!

This means you can now set both machine and screed speed independently—quickly and easily adjust machine to achieve desired results.

What's more the new Finisher-Float is the most versatile machine marketed today. The finisher frame extends from 12' to 26', permitting finishing of everything from full width slabs to ramps and approaches. The finisher section is quickly detached from the float trailer for use on narrower width slab—eliminating the need for a second finisher. Both screeds and float pan are equipped with new extra quick, precision crown change mechanisms.

This great new machine takes the place of a single width finisher, a double width finisher, and a float. It coordinates and combines finishing and floating in one machine with a single operator. A single Flex-Plane combination machine easily maintained pace on the 1958 world's record highway pour. It produces a finish unexcelled in smoothness with a minimum of handwork. See it . . . talk with owners . . . get the facts before you buy and you'll buy Flex-Plane.

To get the facts contact the Heltzell-Flex-Plane distributor in your area or write direct.



ROUND IRON COMPANY

WARREN, OHIO

ALL-NEW ALEMITE "77" LUBRICANT PUMP

packs most power

FOR HIGHEST PERFORMANCE!

68% More Powerful . . . outperforms any other air-operated lubricant pump of its class on the market today! The all-new 5.2 horsepower Alemite "77" Pump assures smoothest, fastest delivery of all lubricants, through longest lines!

Three Master Pressure Ratios for unequalled delivery of all lubricants—fluid, semi-solid and heavy fibrous types. Lightweight, rust-proof aluminum construction.

Precision Engineered from finest quality materials—designed for outstanding ease of operation and maximum performance. Models for 120-lb. or 400-lb. drums—for all industrial applications.

All-New Alemite "77" Features!

- **Volume Air Distributing Valve**—self-seating, self-cleaning, volume porting
- **Modern-Design, Highly Efficient Toggle Trip Mechanism** provides balanced pressure on shuttle . . . won't bind
- **Straight-Line Exhaust** has extra-large port for highest pump efficiency
- **Hardened Steel Piston and Cylinder**, lapped to a precision fit of 125 millionths of an inch
- **All-Steel Primer Valve**, ground to a perfect seal . . . hardened for abrasion resistance
- **Dynamic Primer** assures priming and pumping of heaviest lubricants.



**THREE POWERFUL
"77" MODELS**

• **High-pressure** (40 to 1 ratio) for light-bodied and fibrous greases. Delivery on both up and down stroke.

• **Medium-pressure** (25 to 1 ratio) for heavyweight oils and light-bodied greases. Delivery on both up and down strokes.

• **Volume delivery** (6 to 1 ratio) for light-bodied fluid lubricants. Single-acting pump mechanism.

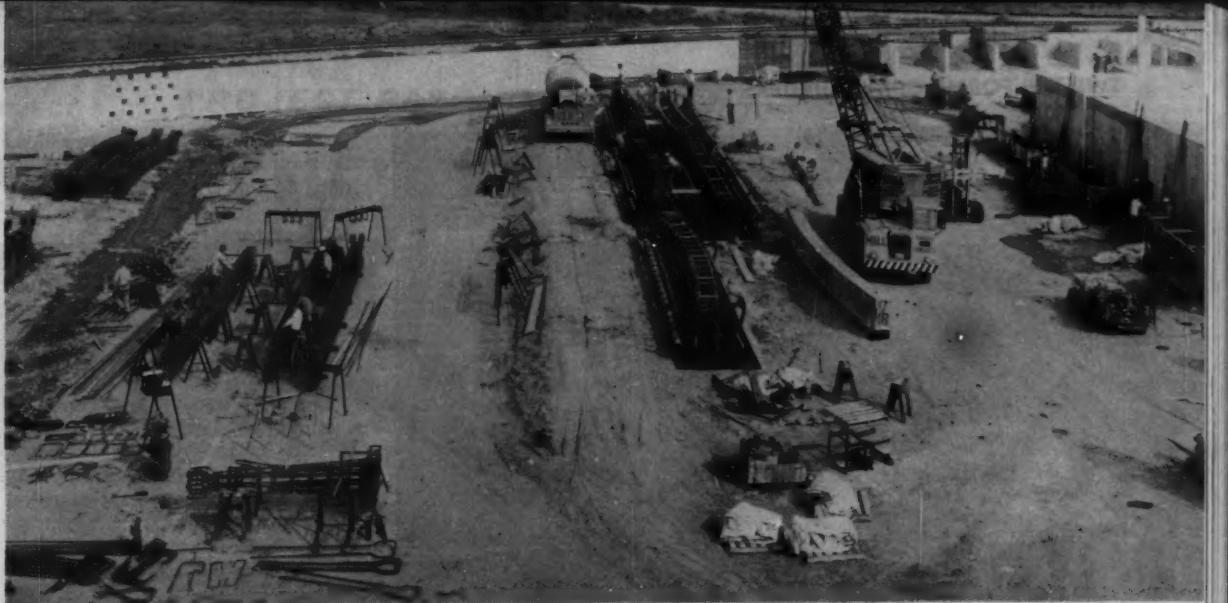


**Write for New Alemite
"77" Pump Catalog**



ALEMITE
DIVISION
STEWART-WARDER
CORPORATION

Dept. P-59 1850 Diversey Parkway, Chicago 14, Illinois



CASTING—Contractor casts girders upside down in rotating steel cradles fitted with shaping devices. The contractor cures the

concrete, rotates the cradles to bring girders right side up, then strips the forms to free girders curved in two directions.

Twisted Forms Curve Girders

WOULD YOU LIKE to be thrown this kind of curve?

California contractor James I. Barnes landed a job to build a circular concrete monorail system at Disneyland Park. Part of the job was the casting of more than 100 curved concrete girders to form an elevated track for rubber-tired monorail trains.

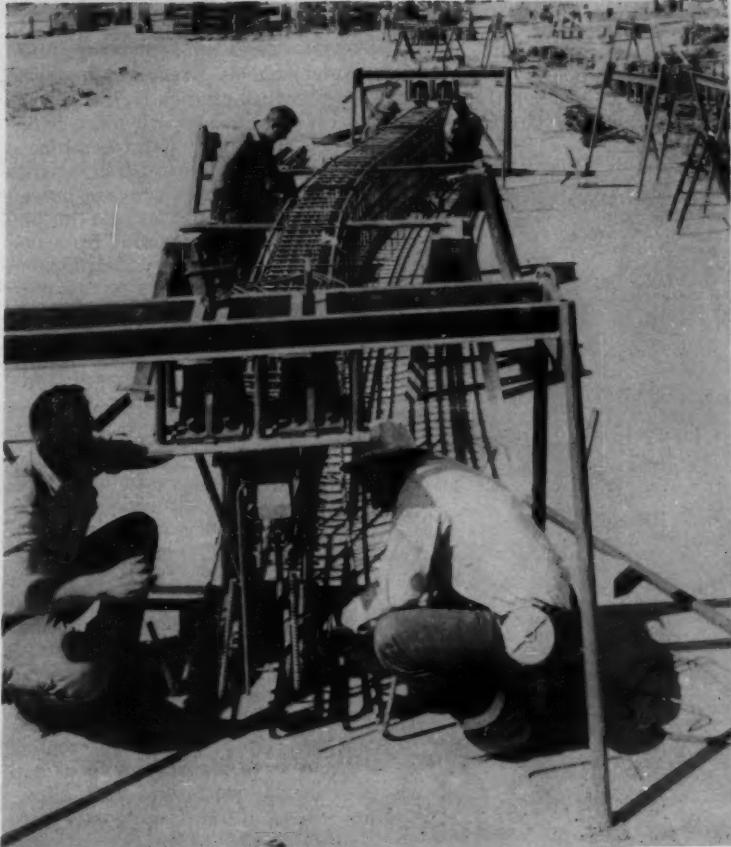
The I-shaped girders—they measure 40 ft long, 18 in. wide, and 34 in. deep—curve in both horizontal and vertical directions. Barnes had to find a way to form the complex curves. And the contractor had to do it within a specified $\frac{1}{8}$ -in. tolerance.

Rotating Forms

The contractor called in two experts to meet the challenge. They were Ceco Steel Corp., reinforcing steel fabricators, and Carbon Dubbs Co. of Stanton, Calif., concrete casting subcontractors. Together they came up with a casting method as unusual as Disneyland.

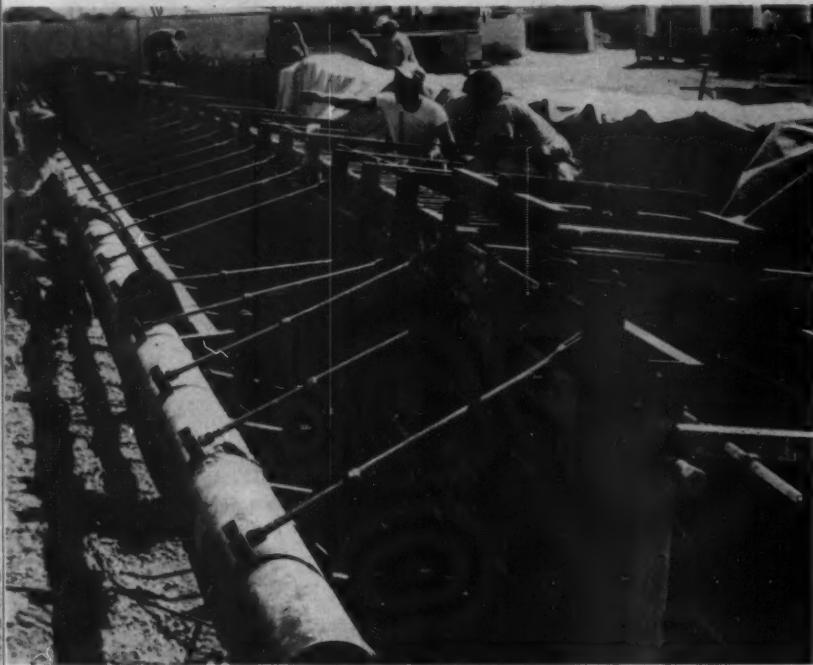
They cast the girders upside down in rotating steel cradles fitted with shaping devices. They cure the concrete, rotate the cradles to bring the girders right side up, then strip the forms.

Girders are cast in five concrete casting troughs set in the ground at the casting yard. Each is about



REINFORCING—Ceco workmen fabricate a curved cage of heavy reinforcing at casting yard. Reinforcing is so heavy concrete going around it has to be vibrated extensively.

TWISTED FORMS CURVE GIRDERS . . . continued



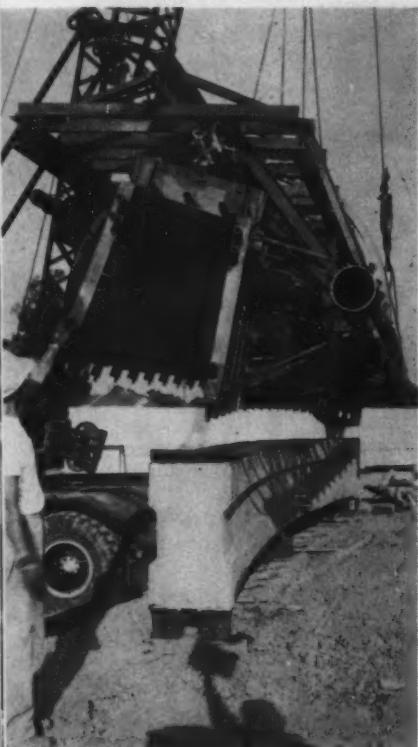
ALIGNING — To give forms horizontal alignment, workmen take up on screw rods raking out on 2-ft centers from one side to bear against horizontal 8-in. pipe.

44 ft long, 6½ ft wide, and 6½ ft deep with walls 8 in. thick. In each trough the contractors fitted steel wheels over which form-supporting cradles roll.

The cradle is a two-piece structural assembly that resembles a car dump. The lower half consists of two semi-circular cross-braced tracks fitted with 2x3x¼-in. angle irons that rake out from one side of the cradle on 2-ft centers to support an extra-heavy-duty 8-in. dia pipe. The pipe runs horizontally down the length of the cradle. It serves as reaction during shaping of forms.

Girder forms, designed and built by Leonard Precision Machine Works of Anaheim, Calif., are fitted to this bottom half. Form sides are shaped from flexible 10-gage steel sheeting braced with vertical 2 x 3x¼-in. angles on 2-ft centers. These go over a sheet steel bottom form braced by three longitudinal steel tubes and by transverse steel web plates spaced on 2-ft centers. Scissors-jacks anchor the webs to the cradle's cross bracing. The contractor places a sheet of roofing paper over the bottom form and slicks side walls with form oil.

Cages of reinforcing steel are prefabricated at the casting yard, bent to proper curvature. Two cast steel seats are fitted to each end of the cage to serve as girder



STRIPPING — Crane lifts entire form-carrying cradle from casting trough and places completed girder on temporary yard support to await transportation to Disneyland.

pedestals when girders are placed on their supporting pylons. A Bay City 25-ton truck crane positions the cage in a form.

Then form aligning work begins. This is the most time-consuming phase of the work and requires the full time efforts of two field survey parties.

Screw rods set on 2-ft centers against the top and bottom of one form side rake out and bear against the 8-in. steel pipe supported on the cradle. Workmen take up on these rods one by one to bring the form to its specified horizontal alignment.

Vertical alignment comes from the scissors jacks attached to the steel webs. These are fitted with screw bolts that extend the scissors to align the forms.

Concreting

Ready-mix trucks chute 5,500-psi concrete directly into the forms. Extensive vibrating thoroughly encases the heavy reinforcing and keeps girders free of voids. Girders are steam cured, permitting stripping of forms after 24 hours.

Stripping begins with the bolting on the second half cradle to the form-supporting cradle. The upper half is similar to the lower one except that it carries no form-aligning or supporting gear.

The entire assembly is rotated on steel wheels set in the trough to turn the girders right side up. The cradles then are unbolted and the entire form-carrying unit is lifted by the crane and set on temporary yard supports. Side forms there are jacked apart, freeing the girders. The form-carrying assembly then is returned to the trough and positioned for a new pour.

Most of the work goes fast, but form alignment takes so much time that concrete can be poured only on an every-other-day basis. Thus, with a six-day week and five sets of forms, 15 girders are produced weekly.

Concrete pylons up to 35 ft. high, to support the monorail, also are cast in the yard. These, along with the girders, are trucked to Disneyland where monorail and pylons are erected by truck crane.

John B. Allen heads all construction for Barnes. On the field are Wayne Cox, project manager; Len Roth, coordinator, and William Palmer field superintendent.

CATERPILLAR'S
**PROJECT
PAYDIRT**

PROJECT PAYDIRT pays off again

NEW CAT NO. 619

TWO-WHEEL TRACTOR



PROJECT PAYDIRT: Caterpillar's multimillion-dollar research program —to meet the continuing challenge of the greatest construction era in history with the most productive earthmoving machines ever developed.

NEW 225 HP CAT NO. 619 TRACTOR



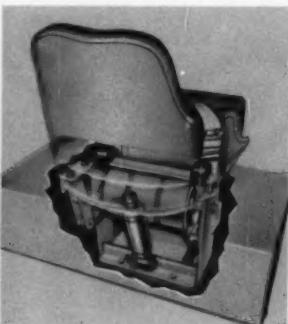
New Swing-away Dash. Permits timesaving access to the starting engine, air compressor and hydraulic pump. Entire left side of engine can be exposed without having to disassemble any major components connected with dash.



New Turbocharged Cat Engine. Meets the specific requirements of the No. 619. Develops 225 HP and a full 20% torque rise — for fast acceleration on cut or haul road. Fuel system permits use of economy-type fuels.



Fast Servicing. Unit construction offers unmatched accessibility to the transmission, differential and cable control. They can be quickly removed from tractor for servicing. Each axle can be pulled out by removing only 6 capscrews.

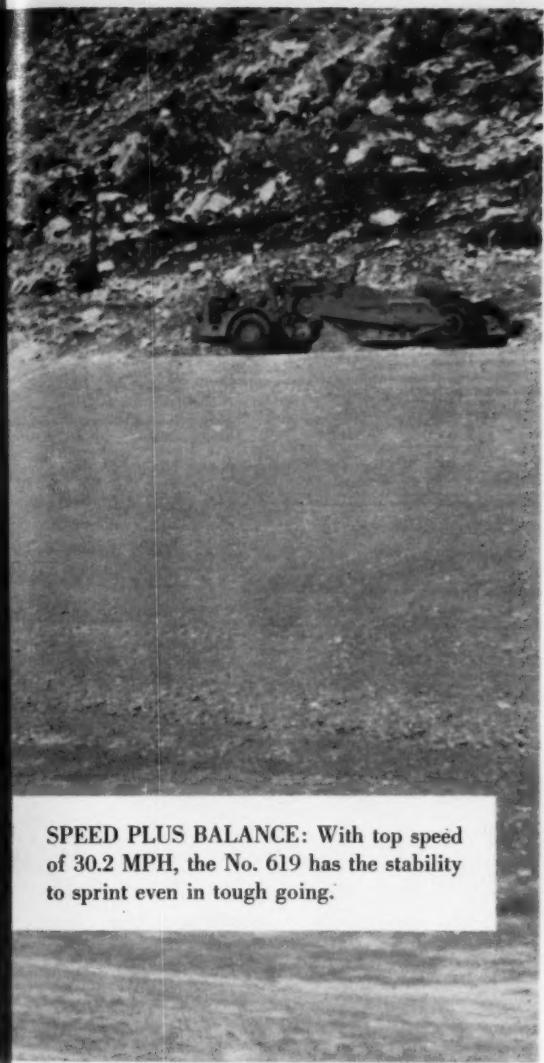


New Torsionflex Seat. New seat provides "highway" ride on off-highway conditions. Helps conserve operator's energy, lessens his fatigue, enables him to do more work per shift. The seat is standard on the new No. 619.

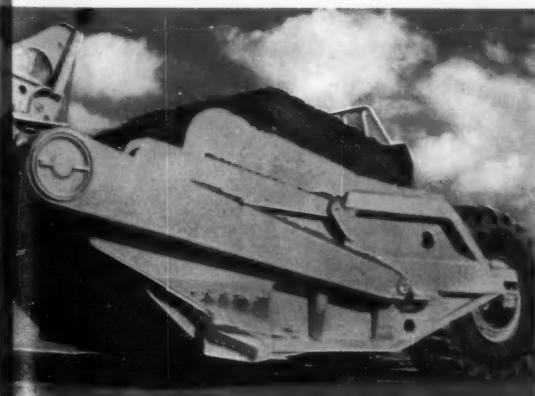
S
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to

New No
for high
yd. struc
capacity

619 AND 14 CU. YD. NO. 442 SCRAPER



SPEED PLUS BALANCE: With top speed of 30.2 MPH, the No. 619 has the stability to sprint even in tough going.



New No. 442 Series B LOWBOWL Scraper. Matched to the No. 619 for high production and fast loading. Capacity ratings: 14 cu. yd. struck and 18 cu. yd. heaped. Also available is the 25-ton-capacity Athey PR619 Rear Dump Trailer.

- First two-wheel tractor to deliver four-wheel speed and roadability!
- Matched with new No. 442 Series B LOWBOWL Scraper for new high production... 14 cu. yd. struck, 18 cu. yd. heaped!

The new No. 619 Series B represents a major breakthrough in two-wheel tractor-scraper design. It combines two-wheel traction with four-wheel speed and roadability for high productivity on a wide range of applications. And that's not all. It affords new type unit construction and timesaving accessibility never before built into this type of machine.

The No. 619 has a new Turbocharged engine that delivers 225 HP. This rugged engine develops a torque rise of 20%—for fast acceleration. It provides a top speed of 30.2 MPH. The No. 619 can really get out of the cut and run—and run under conditions that slow down other make two-wheel rigs.

That's because of its roadability. Advance Caterpillar design has achieved a tractor-scraper balance resulting in rides that "smooth out" to an amazing degree. This balance permits higher speeds for more cycles per hour. It also lessens operator fatigue for more cycles per day.

With all this, new 2-jack hydraulic steering makes the No. 619 extremely easy to maneuver, yet retains that important "feel of the road" touch. Design permits full 90° turns and a turning diameter of 30 feet.

As for accessibility, here's one example: A new swing-away dash allows ready access to the starting engine, air compressor and hydraulic pump with a minimum of time and effort. Another example: By removing six capscrews in the planet carrier cover, each axle can be removed from the tractor. The planetaries are interchangeable between sides.

Like all achievements of Caterpillar's Project Paydirt, the No. 619-No. 442 unit has been thoroughly job tested. Four years of in-the-field operation prove this: on every count—production, accessibility, economy—this new rig outperforms other make machines.

How much does this mean to you profit-wise? Of course, that depends on your jobs. But this is certain—there's nothing like the new No. 619-No. 442 in the field today. Get the complete facts about it from your Caterpillar Dealer. Ask for a demonstration. See for yourself how it can step up production and profits on a wide range of applications.

Additional facts about the No. 619-No. 442

Six-speed forward, two-speed reverse constant mesh transmission • Standard wide-base 26.5-25, 24-ply tubeless tires all around—optional treads and ply ratings available • Choice of in-seat gasoline starting or direct electric starting • Fuel tank capacity—85 U.S. gallons • Shipping width—10' 10".



YOU NAME IT... CATERPILLAR HAS THE RIGHT MACHINE IN THE WORLD'S MOST COMPLETE EARTHMOVING LINE!

No other manufacturer offers the complete earthmoving line-up that Caterpillar does. No matter what type of machine you need, you'll find a Caterpillar unit to meet your specific requirement. What's more, each machine is a modern, heavy-duty unit, designed to do more work at lower cost with less down time than any

in its class. That's because Caterpillar keeps every model up to the minute with design developments and improvements sparked by Project Paydirt.

The new No. 619-No. 442 is one of many examples of this leadership in action. Here's the line-up:



5 Track-type Tractors: Led by the "take-charge" D9 (320 HP), there's the new D8 (225 HP), D7 (140 HP), D6 (93 HP) and D4 (63 HP). All are flywheel ratings. Plus a complete selection of 'dozers (including the No. 7G Bulldozer), rippers, tool bars and tool bar equipment.

3 Motor Graders: You have a complete selection in the big new 150 HP, 29,280 lb. No. 14; the 115 HP, 23,000 lb. No. 12 and the 75 HP, 20,805 lb. No. 112. Cat Motor Graders are known as "the standard of the industry." Optional on all three: the now transistorized Preco Automatic Blade Control, which maintains blade accuracy of $\frac{1}{8}$ " in 10'.

3 Traxcavators: The front-end loaders provide a range of capacities that meet every purpose—No. 977 ($2\frac{1}{4}$ cu. yd. bucket); No. 955 ($1\frac{1}{2}$ cu. yd.) and No. 933 ($1\frac{1}{8}$ cu. yd.). All can be equipped with the exclusive Side Dump Bucket, or other quick-change attachments—special buckets, teeth, bulldozers or forks.



4 Wheel-type Tractors: Besides the new No. 619, the two-wheeled DW21 (345 HP, max.), the four-wheeled DW20 (345 HP, max.) and DW15 (200 HP, max.) team with matching LOWBOWL Scrapers: the No. 470 (19.5 cu. yd. struck), No. 482 (24 cu. yd. struck), No. 456 (19.5 cu. yd. struck) and No. 428 (13 cu. yd. struck) respectively. Athey Trailers couple with Cat wheel-type Tractors for rear or bottom dumping.

Your Caterpillar Dealer backs you with prompt, on-the-job service around the clock. He's the man to see about the most productive earthmoving line in the field. Call him today!

Caterpillar Tractor Co., San Francisco, Calif.; Peoria, Ill., U.S.A.

CATERPILLAR

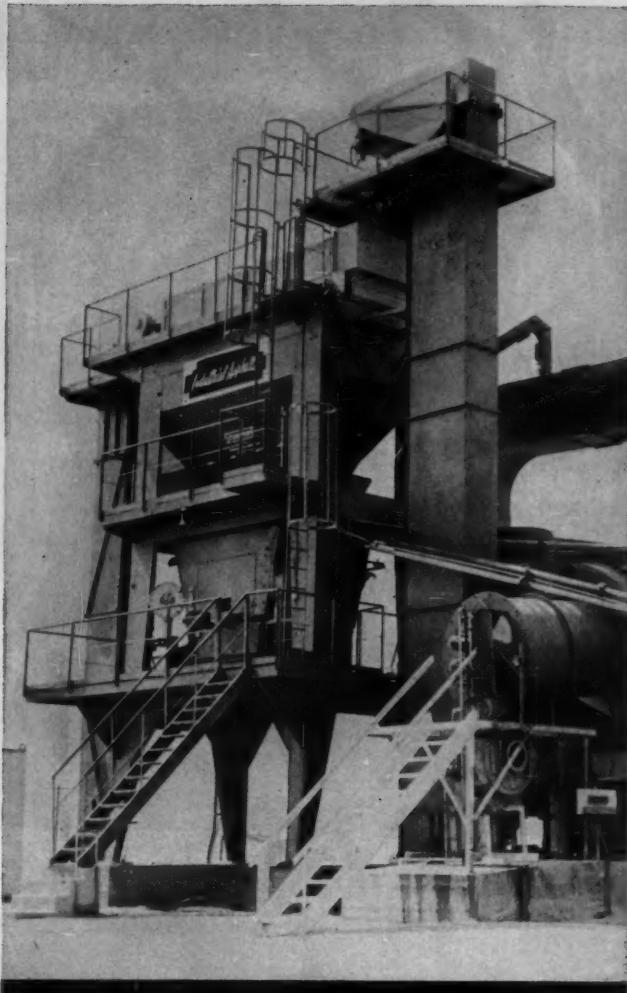
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**DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT**

BORN OF RESEARCH
PROVED IN THE FIELD

AMERICA'S NUMBER ONE ASPHALT PLANT!

Successful contractors throughout the nation recognize the STANDARD model R-M as AMERICA'S NUMBER ONE ASPHALT PLANT because of its superior design and quality.

Big — Fast — Rugged — Clean — Economical — describe the STANDARD model R-M Asphalt plant with its king-size capacity — Super-Lift dryer (with saw-tooth lifter) — heavy duty, Hi-Speed mixer — Simplex push-button batching control — positive control of liquid asphalt — over-size elevator and vibrating screen — are some of the many money making features assuring higher production with less maintenance for successful contractors — everywhere!



Available in 2000, 3000, 4000, 5000, 6000, 7000 and 8000 pound batch capacities. No matter what your hot mix needs are, there's a STANDARD R-M plant to do the job. Economical, low erection and operating costs provide more profits year in, year out.

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Model **R-M**
ASPHALT PLANTS

STANDARD STEEL CORPORATION

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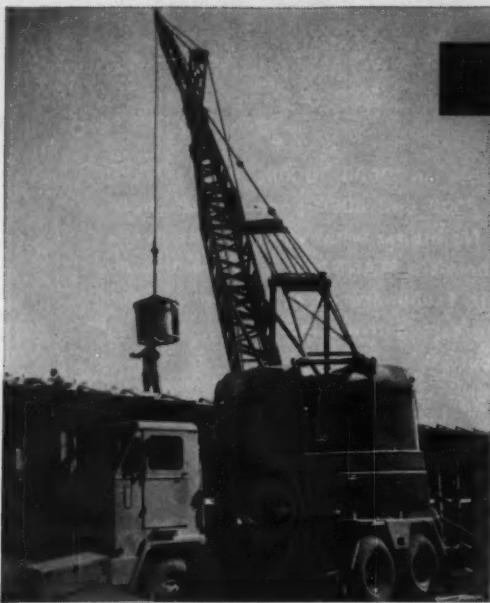
Midwest Offices & Plant **LEADER IRON WORKS** Decatur 89, Illinois

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ROTARY DRYERS • KILNS • COOLERS • ASPHALT PLANTS



Modern dumper



GAR WOOD "BT" TRUCK CRANES are the most modern on the market. From custom-built carrier with high-speed mobility... through 3-shaft machinery deck, arranged pyramid fashion for easy accessibility to every gear, drum, brake and clutch... to positive controls that retain important operator "feel" of every operation, Gar Wood truck cranes combine precision performance with rugged dependability.

Advanced Engineering



GAR WOOD - ST. PAUL TRUCK EQUIPMENT is built the way you'd expect the world's leading manufacturer to build it: rugged enough to take the day-in, day-out abuse of overhead loading; yet with a precision hydraulic system to handle controlled dumping smoothly, accurately. It's the most advanced and complete line of arm-type and front-mounted telescopic hoists, with matching bodies for every job requirement.

features are "standard equipment" with GarWood-Buckeye!

Modern ditcher features pay off big in increased production, in ease of operation, and in low maintenance costs. And—there's no reason for you to pay "big" to get them! On advanced Gar Wood-Buckeye wheel-type ditchers, modern features like these are "engineered-in" as standard equipment at no extra cost:

HYDRAULIC CONVEYOR DRIVE—With three speeds in either direction to handle any volume of spoil regardless of digging wheel speed. Conveyor control is instantaneous, and independent of all other functions.

HYDRAULIC DIGGING WHEEL HOIST—Hydraulic system allows quick and precise adjustments for depth and grade independent of conveyor, travel or digging wheel speeds.

MODERN POWER TRAIN—Only Buckeye has a transmission specifically-designed for ditcher work! Power for traction and digging is transmitted through separate output shafts. You get more power where you need it—at the digging wheel. And with reduced fuel costs, too.

SIMPLIFIED GROUP CONTROLS—Operation is faster, easier and far more accurate because all controls are grouped for operator convenience. Speeds are easy to select and use. Hi-Lo traction speed greatly reduces shifting.

SPLIT-SHAFT EXCAVATOR DRIVE—Assures equal drive power to both sides of digging wheel. Maintenance is much easier and faster.

Only Gar Wood offers these advanced, high-performance features as standard equipment, plus exclusive factory customizing for every digging condition, every application. Don't settle for less than a *modern* ditcher. That's Gar Wood-Buckeye!

pays off big in all Gar Wood equipment...



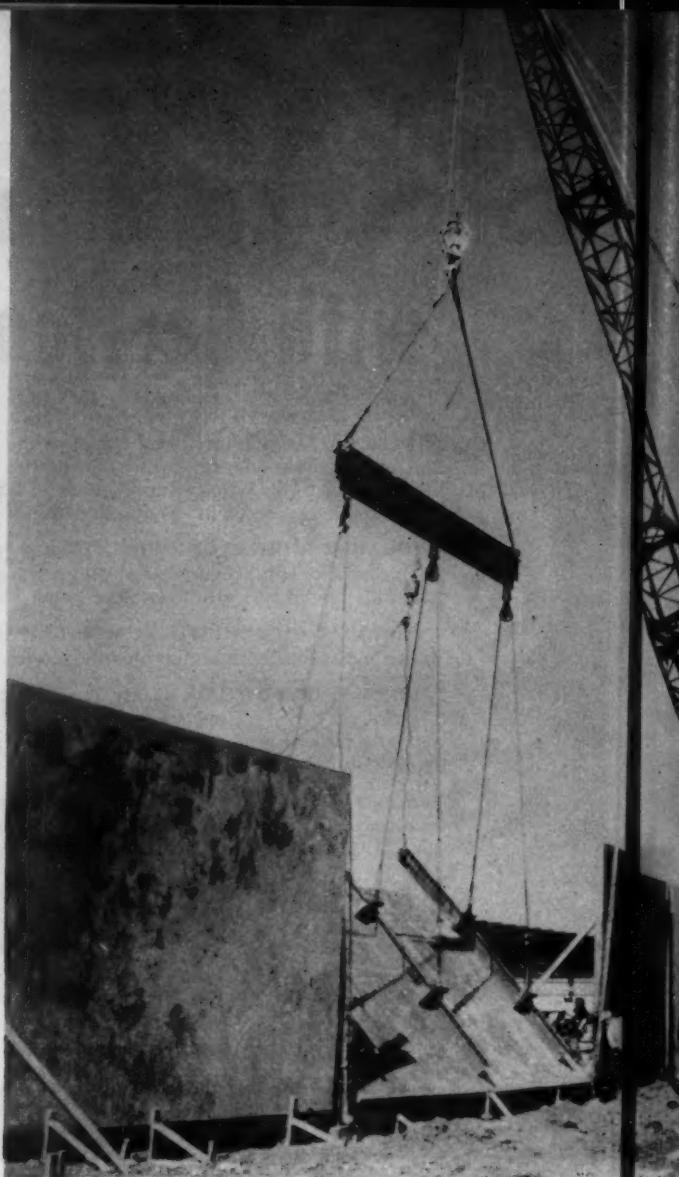
GAR WOOD TRACTOR EQUIPMENT is engineered for dependable performance with high-production Euclid Tractors like the 425 hp TC-12. Gar Wood has developed such revolutionary design features as cable control units mounted as an integral part of the tractor... Tipdozers with hammerhead-type push beams... Dozecasters with thrust arms attached by "deep-anchored" lugs.



It takes this contractor just half an hour to bolt strongbacks to a precast wall panel, tilt it into position, and brace it into final place.



PREPARE PANEL—Workmen bolt strongbacks to lift lugs cast into panel face while lift crane jockeys into working position.



BEGIN TILT-UP—P&H crane lifts panel through a steel spreader beam fitted with sheaves and steel cables, the ends of which hook

Three Men and a Crane Tilt Up

A PANEL IN PLACE every 30 minutes—that's the assembly line rate of tilting up wall panels for a \$400,000 one-story building near Atlanta, Ga.

The building was designed with 5½-in.-thick exterior concrete walls 13½ ft high. M&K Construction Co. of Atlanta, the contractor, elected to cast the walls in panels on the building's floor slab, then lift the panels one by one into final position.

M&K uses the structure's concrete floor as a casting bed. The contractor sprays the floor 14 ft in from the edge with Gardian Clear Bond Sealer and Tech-kote, a lift-slab bond-breaking compound.

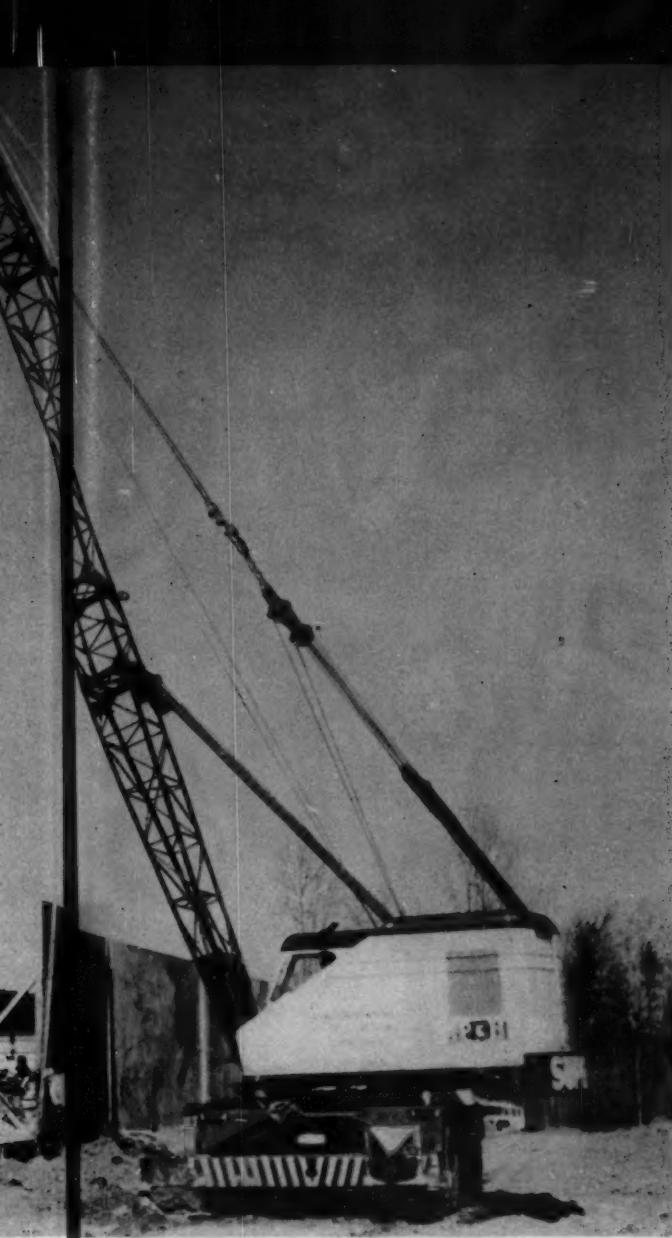
Forms of 2x6-in. planking are set in a 13½x30-ft rectangle for each panel. Panel reinforcing consists of No. 3 bars placed 10 in. on centers both ways. Cast into the panels are Medco tilt-up lugs that provide a means of raising panels into position by strong-

backs, and Medco bracing lugs that provide an insert for post jacks that temporarily hold panels in position once they are raised.

Transit-mix trucks deliver concrete to the job. Concrete is a 3,000-psi mix containing Gaylite lightweight aggregates. Trucks move around the building site and chute directly into the forms. There, concrete is struck off at 5½ in., trowelled smooth, then left to cure 14 days before tilt-up operations get under way.

Superior Rigging and Erecting Co. of Atlanta handles the tilt-up operation. Jack Heaton, Superior's superintendent, bolts three 12-in. H-beam strongbacks to the lifting lugs cast in the panel.

Heaton then brings a P&H crane into play. The crane lifts through a steel spreader beam fitted with sheaves and steel cables, the ends of which hook at



at two points into each strongback. Workmen push the bottom of the panel into position on a seat notched into floor.

Wall Panels

two points to brackets that tie the strongbacks to the slab.

The crane gently tugs at the panel to break the seal between it and the floor slab. Raising goes fast from that point on. The crane lifts the panel. Hoisted by the crane's whip line, snap lines fitted to the two outer strongbacks tilt the panel vertically while three men push its bottom into position on a seat notched into the edge of the floor slab.

A single man threads three Medco post jacks into the brace lugs cast into the concrete, rakes the posts out at a 45-deg angle, and braces them against the concrete floor. Strongbacks finally are freed and put to work on a new panel. Bolting on of strongbacks, tilt-up, bracing, and removing strongbacks takes less than 30 min. per panel.

E. R. Brewer is superintendent for M&K.



RELEASE STRONGBACKS—Workman unfastens strongback from raised panel with the help of a simple bolt-and-eye bracket assembly.



BRACE PANEL—Medco screw jacks fitted to 2x4's make post jacks that brace panels until H-shaped concrete columns are poured.

the ALL-NEW

125-cfm GYRO-FLO



Now better than ever...

Completely new from the ground up—backed by 10 years of rotary field experience—this all new Ingersoll-Rand Gyro-Flo 125 portable rotary compressor is based on results of extensive research, performance evaluation and customer suggestions.

Smaller and more compact than the original Gyro-Flo 125, this new unit incorporates many of the proven Gyro-Flo design features plus a host of new features that make it the best 125-cfm portable compressor available.

Some of its features are; larger engines at slower speed (1800-rpm)...60" track for greater stability on rough terrain...full-length tool boxes with more storage capacity...side covers that fold back safely away from operating eye-level...fuel and air tanks under lockable cover to guard against tampering...automatic drainage of oil from cylinders when unit is shut down...and provision for inspection of all rotor vanes. The new Gyro-Flo 125 is powered by 1800-rpm Continental engines—either gasoline or diesel. Ask your Ingersoll-Rand representative for complete details or send today for a copy of Form 2930.



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DIMENSIONS AND WEIGHTS		
2-WHEEL MOUNTING	GASOLINE	DIESEL
Weight (dry)	2442	2503
Weight (wet)	2647	2737
Length, incl. draw bar.....	10'1"	10'1"
Width	5'8¾"	5'8¾"
Height	5'1½"	5'1½"
Track	60"	60"

LESS RUNNING GEAR (INCL. SHIPPING SKID)		
2-WHEEL MOUNTING	GASOLINE	DIESEL
Weight (dry)	2165	2226
Weight (wet)	2370	2450
Length	5'9¾"	5'9¾"
Width	2'8¼"	2'8¼"
Height	3'8¾"	3'9½"

AN UNBEATABLE COMBINATION...GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS



VERSATILE! Moline Industrial Wheelers let you mount mowers, loaders, backhoes, log forks, scrapers, dozers in minutes

Speed work cycle 40% with new Moline instant shuttle reverse!

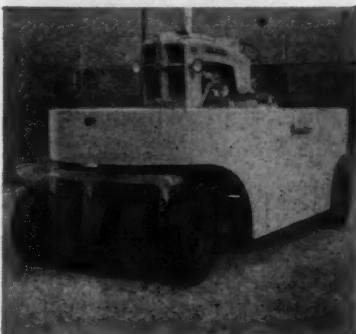
Load under full power . . . back away fast . . . dump . . . and you're in for the next bucketful. All with a flip of a lever! It's new!

Moline 335 Industrial Wheeler has wide choice of hydraulic pumps for front or rear-mounted equipment. Worksavers like the Triumph Hydro-Clipper and the Moline L3 Loader (above and right on the 335) are mounted or removed in minutes.

The brute power of the 335 (47 b.h.p.) handles big equipment. The L3 Loader has a big half-yard struck bucket with 3500 pounds breakout. Six-speed reverse shuttle and power steering make the 335 easy to handle, fast and accurate on any job.



Converts quickly, easily for any job.



Moline Power Units and torque converter power "Packages" are used in O.E.M. machines like this Ferguson Model SP-12 pneumatic-tired Compactor by Shovel Supply Co., Dallas.



Moline 445 Industrial Wheeler has high torque. With LX or DX Backhoe, the 445 has 7,000 pounds digging force. Power steering. New Moline instant shuttle reverse.

Get more done every working day with Moline equipment *matched* to the job! Buy the particular piece of equipment you need now—add other easy-mounting, perfectly *matched* Moline units any time your jobs require it. Fully warranted by Minneapolis-Moline; maintenance and service are simplified; parts immediately available.

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Industrial Dealer today!**

**MINNEAPOLIS
MOLINE**

makes the NEWS in modern industrial and construction equipment

Q

Why do so MANY
forward-thinking concrete erectors
buy Hydrocranes?

A

**ONE BIG REASON IS SOLID
OUTRIGGER STABILITY**

Four patented hydraulic outriggers are the keys to the amazing lifting capacity and stability of the Bucyrus-Erie 12-ton Hydrocrane.

These four legs of steel extend — both outward and downward — and set in seconds at the touch of a lever, leveling the crane hydraulically . . . even on rough, uneven ground. They give you big-machine stability for heavy lifts, small-machine compactness for close-quarter work, extra leverage for big over-the-side lifts.

Feature by Feature—It Fits YOUR Needs

- telescoping boom reaches in and out, over and under
- quick setups and knockdowns, road speeds up to 50 mph
- unbeatable precision and safety with all-hydraulic control
- mounts on new or used commercial truck

Your Bucyrus-Erie distributor will give you all the facts. Ask him to prove them with a demonstration. Write department 6HB for free bulletin. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

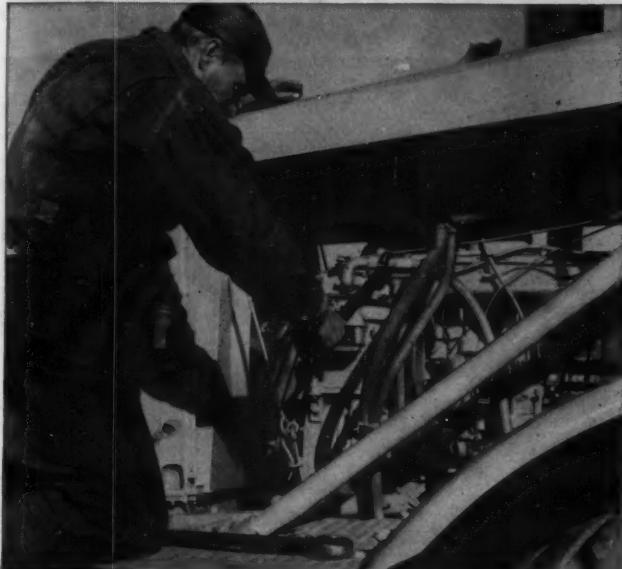
**BUCYRUS
ERIE**



Over 50% of Hydrocranes sold last year were repeat sales

"We have Standardized on Aeroquip Hose Lines for Quick Replacements That Stand Up in Use"

Reported Dan Anderson, Equipment Superintendent of Utah Construction Company's Belair Maintenance Base, San Francisco



Aeroquip Hose Lines are used for fuel, oil, hydraulic steering and air compressor discharge lines on this Euclid engine.



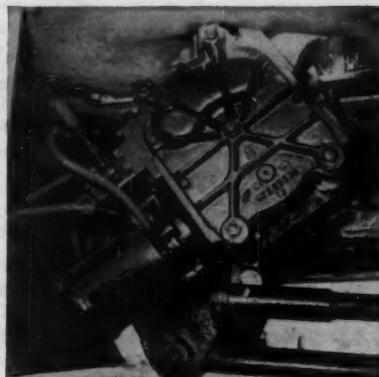
In overhauling 22-ton Euclid TD rear dump trucks at the Belair Maintenance Base, Utah mechanics use Aeroquip Hose Lines with Reusable Fittings for all fuel, lube and hydraulic lines.

"We like the quick replacement feature of Aeroquip Hose Lines," says Superintendent Anderson, "and the fact that they stand up so well particularly in the rough terrain in which we operate."

Cut costly downtime on your equipment. Use Aeroquip Hose and Reusable Fittings for quick-replacement hose lines that stand up under rough use. Call the Aeroquip distributor listed in your Yellow Page Phone Book.



This Utah mechanic is installing a brake line made of Aeroquip Hose and Reusable Fittings.



Another Aeroquip Hose installation is on this hydraulic steering gear unit of a Euclid truck.



Aeroquip 1503 Medium Pressure Hose and 1509 High Pressure Hose is used on hydraulic tank and pump lines.



AEROQUIP CORPORATION, JACKSON, MICHIGAN

INDUSTRIAL DIVISION, VAN WERT, OHIO • WESTERN DIVISION, BURBANK, CALIFORNIA

AEROQUIP (CANADA) LTD., TORONTO 19, ONTARIO

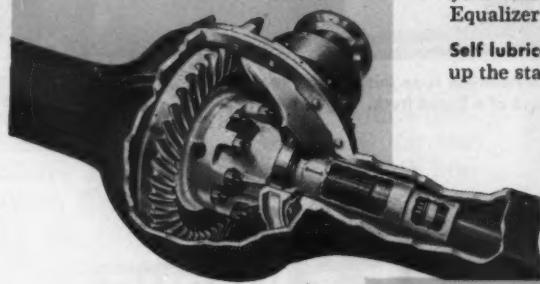
LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

NEW ROCKWELL TRACTION EQUALIZER...

puts the
action
where there's
traction!



Available
with
Timken-Detroit Axles
for safer,
surer performance...
on or off
the highway!



Another Product of...

ROCKWELL-STANDARD
CORPORATION



Transmission and Axle Division, Detroit 32, Michigan

Soil Cement...

There are several ways to put down soil-cement base. Each method has distinct advantages. Here are three contractors who let the job determine which method will work best.

SHAPING—Grader shapes road base to approximate crown and elevation. Then, with scarifying attachment, grader returns to pulverize base for mixing with cement.



One Rig Does All The Work

SINGLE-PASS flat-type stabilization seemed to Blount Construction Co. the best way to place 70,000 sq. yd. of soil-cement base for a road a few miles from Atlanta, Ga. But rugged soil conditions forced some innovations.

Specifications called for the placing of a soil-cement base 5 in. deep and 26 ft wide to be paved with a 1½-in. wearing course of bituminous concrete.

Normally, a motor grader would shape the surface to approximate crown and grade. Then, a high-speed pulverizing rotor would pass over the surface and scarify the soil to prepare it for blending with cement and water.

But, on Blount's job, the soil is hard. So the contractor fitted a scarifying attachment to a motor grader. This breaks up the soil to an 8-in. depth as the grader shapes the base.

While the grader completes this work, a crew sets stakes to control paving width and to guide equipment operators. Then a cultivator, drawn by an International Harvester tractor, distributes cement over the prepared base in 6-ft swaths. This is followed by a P&H single-pass stabilizer that



BLENDING—P&H single-pass stabilizer blends cement and soil dry, adds water, and mixes materials in a single pass to leave behind a base that needs only compaction.

blends the cement and soil dry, adds water in specified quantities, then mixes the material wet. All this is done in a single pass.

A tractor-drawn sheepfoot roller compacts the mixture to 5 in. The motor grader then scratches the surface lightly with its scarifying attachment to remove compaction planes left by the sheepfoot rollers.

Final compaction comes from several passes by tractor-drawn,

rubber-tired rollers. The grader follows up a last time to trim and scrape away ridges and do any necessary final shaping of the base.

The contractor sprays a curing coat of asphalt over the soil-cement base the following morning. The base, then, is left to cure for a week before 1½-in. course of bituminous concrete wearing surface is placed.

continued on next page

Soil Cement... continued



SPRAYING CEMENT—Wood cement truck sprays specified layer of cement on base pulverized by motor grader with scarifier.



WETTING AND BLENDING—Water tank truck wets down base while a Bros mixer follows up blending soil, cement, and water.



COMPACTING—Buffalo-Springfield Compactor compacts prepared 12-in. soil-cement base down to specified 8-in. thickness.



FINAL ROLLING—Seaman-Andwall rubber-tired roller provides final compaction before paving with bituminous concrete.

Rotary Mixer Blends Thoroughly

TO GET MAXIMUM workability out of the soil, C. W. Mathews Co. of Marietta, Ga., places soil-cement base for a state highway between Forsyth and Monticello with a multi-pass rotary mixer. The soil-cement here serves as a base for a 3½-in. bituminous concrete wearing surface.

This method differs from the flat-type technique basically in that it is a multiple-pass operation. Preparation work remains the same. The material first must be shaped, scarified, and pulverized to give it maximum workability. Mathews shapes the base with a motor grader. The grader, with a scarifying attachment, then breaks up the soil to a 12-in. depth. The contractor prewets

the soil by water truck to add to its workability. Last step before blending begins is the shaping by motor grader of base to crown and approximate grade.

Cement is spread over the soil by a Wood cement tank truck. This is followed by a Bros rotary mixer that passes over the base to blend cement, soil, and a small amount of water. Object of this pass is to distribute the cement throughout the soil mass. Only enough mixing is done to prevent cement balls from forming when more water is added.

The contractor then adds water in increments to bring the mixture to optimum moisture. Between each increment, the rotary mixer blends the soil, cement,

and water. Mixing continues until the three materials are thoroughly blended to the full depth and width of the treatment.

A Buffalo-Springfield Compactor rolls the material to 8-in. finished depth. This is followed by a grader that scratches the surface to remove the compaction planes. Finally, several Seaman-Andwall rubber-tired rollers move in to give the base its final compaction.

The contractor sprays an asphalt curing seal over the surface the following morning. Five days later, he begins the placing of a 3½-in. bituminous concrete wearing surface over the base to complete the job.

continued on page 129

ENGINEER'S FIELD REPORT

PRODUCT

RPM DELO OIL

FIRM

M. M. SUNDT
CONSTRUCTION CO.
Tucson, Arizona

RPM DELO OIL ends 5 years of engine troubles



The pan has never been off the Caterpillar D7 engine of this Link-Belt Speeder shovel in 7 years, using RPM DELO Oil. Only repair was a single valve job—no other parts replaced. William Naumann, Sundt's Operations Manager, says, "We tried nine different major brands of oil in five years, trying to lick the frequent breakdowns that slowed our operations. Sometimes, main and rod bearings even froze solid on the crankshaft. We changed to RPM DELO Oil seven years ago, and, since then, have never had any engine troubles due to oil failure. We now use RPM DELO Oil exclusively in our 22 heavy-duty engines."

For More Information about this or other petroleum products or the name of your nearest distributor, write or call any of the companies listed below.

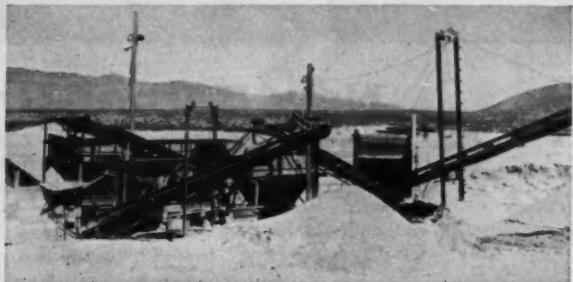


TRADEMARK "RPM DELO" AND DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey



Lubricated with RPM DELO Oil, this Caterpillar D 13000 portable unit powered a rock crusher of M. M. Sundt Construction Co. for a total of 8976 hours before overhaul. "In spite of extremely dusty conditions the only time the engine was touched was to replace a head—no other repairs were necessary," reports master mechanic Billy Gray, shown replacing air cleaner on unit following overhaul.



Austin 101 rock crusher, powered by Caterpillar unit described above, works 20 hours a day at firm's materials stockpile outside Tucson. Company works year around on road paving, grading, foundations, building construction.

Why RPM DELO Oils reduce wear —prolong engine life



- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearings
- Inhibitor resists crankcase foaming

STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado



New Barber-Greene approach to road widening and shoulder paving

The new Barber-Greene Road Widener is a completely new solution to road-widening problems—a machine that lays all materials . . . handles all road-widening jobs.

These exclusive advantages offer a standard of road-widening performance never before available:

New interchangeable attachments—strike-off attachment handles all materials and is hydraulically variable in width while operating. Concrete attachment includes vibrator. Exclusive screed attachment lays all asphalt mixes with Barber-Greene's famous tamping-leveling action. Attachments are hydraulically raised while paving.

New 2-unit design—the machine consists of tractor and trailer. Tractor includes receiving hopper, side discharge conveyor, power and controls. Attachments are mounted

on trailer unit, giving long-wheel-base stability and new steering control and accuracy. Hydraulic jib hoist swings attachments to trailer.

New steering principle—hydraulically controlled steering gives unmatched accuracy. Extra long wheel base eliminates side-drag problems. New oscillating push rollers compensate for truck misalignment.

Complete portability—travels over 10 mph. Tractor and attachments ride on trailer for transporting at normal road speeds.

All-hydraulic controls—strike-off width hydraulically adjustable while paving . . . hydraulic steering, brakes, jib hoist, and self-cleaning hopper . . . hopper conveyor controlled hydraulically for both speed and position.

These are just the high spots. Ask for complete details.

59-8-W

Barber-Greene



AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS... ASPHALT PAVING EQUIPMENT

Soil Cement... continued

CENTRAL PLANT — Cedarapids central mixing plant turns out 3,500 yd of cement-stabilized aggregates a day for a base to be paved with bituminous concrete.



PREPARING BASE — Caterpillar motor grader shapes road to approximate crown and finished elevation.



SPREADING — Trucks dump ready-mixed cement-stabilized aggregates into a tractor-pushed Jersey Spreader that places material in 12-in. layers.

Plant Turns Out Quality Mix

HIGH PRODUCTION is the reason Southeastern Highway Contracting Co., putting in six miles of four-lane road between Rome and Cartersville, turned to stationary central plant mixing.

Stationary plants prove most efficient on jobs that require borrow, or where cement must be mixed with graded aggregates. Southeastern employs the stationary plant to mix cement with graded aggregates for a stabilized base designed to carry a 3½-in. bituminous concrete wearing surface. Southeastern, with the plant, manufactures and places 3,500 yd of material a day.

The contractor first prepares a subbase. A Caterpillar motor grader shapes the subbase to crown and grade then, with a scarifier attachment, breaks up the surface to a 12-in. depth. Tractor-drawn sheepfoot rollers compact the scored surface to a sturdy subbase.

At the off-site mixing plant, a portable crusher breaks up into

raw sizes granular material taken from off the job area. Material comes from the crusher onto a conveyor that feeds it into a Cedarapids central mix plant.

Aggregates feed into a continuous-mix pug mill where they are blended with fines, cement, and water. The fines, cement, and water are stored in bins and silos alongside the plant.

The pug mill discharges into haul trucks that carry the material to the job. There, trucks dump into two tractor-pushed Jersey Spreaders that lay a base course 12 in. deep in single passes.

Two Austin-Western 10-ton steel-wheel rollers follow up and compact the fill to the specified 8-in. depth. Once again the motor graders pass over the fill to shape the crown and trim away ridges left in the surface.

Then the rollers make another pass dragging behind them three Austin-Western vibratory compactors to further consolidate the base.



COMPACTING — Austin-Western steel-wheel roller pulls vibratory compactors.

A fine spray of water over the surface is pressed into the base with rubber-tired rollers. This is followed by a final pass by motor graders to dress the surface before a curing coat of asphalt is sprayed on. After the base has cured for a week, the contractor begins placing the bituminous concrete wearing surface.



Geared by FULLER . . .

...M-R-S 38 Cubic Yard Scraper Combination equipped with R-1550 ROADRANGER®

M-R-S Manufacturing Company, Flora, Mississippi, recently announced a new 38 cubic yard, struck—48 yard, heaped—capacity scraper combination.

The 600 hp M-R-S Model 250 Tractor provides ample power to pull the big scraper at speeds up to 34 miles per hour, with a substantial power reserve for maximum gradability. When necessary, traction to the drive wheels can be increased by use of the M-R-S hydraulic weight transfer feature.

To make most efficient use of the power and traction of the Model 250, M-R-S offers as standard equipment the Fuller R-1550 9-speed ROADRANGER® Transmission.

Designed for off-highway service with the largest high-speed diesel engines built, the semi-automatic R-1550 ROADRANGER features nine forward and two reverse ratios, all controlled with one gear shift lever. Short, even steps between gear ratios—averaging 38%—combined with pre-selected,

automatic range shifts, permit proper gearing for all conditions at all times. Air powered countershaft inertia brake allows quick upshifts without double clutching. For faster work cycles, lower fuel consumption, longer engine life, less operator fatigue, GREATER PROFITS . . . specify Fuller. Your equipment dealer or manufacturer can recommend the most efficient, easiest-shifting Fuller Transmission for your specific operating requirements.

FULLER

TRANSMISSION DIVISION
MANUFACTURING COMPANY
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Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.
Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative



ON SCHEDULE-IN SOLID ROCK!

Even after ripping up 5 feet of frost, stripping 12 feet of overburden, then blasting and digging down 14 feet in solid limestone, this 3000 foot storm sewer job is on schedule. The American 795 Series 1 1/2 yd. Backhoe owned by Lametti & Sons, Inc., St. Paul, is helping maintain a pace of 100 feet per 8-hour day. Rock jobs require tough equipment . . . American gives you work proved excavators with smooth power, fast cycling, responsive controls to keep jobs on schedule with lowest downtime! American Distributors will give you all the data on this complete line!



22½ TON CAPACITY is offered in the compact, hardworking American 200 Series Truck Crane that works efficiently in tight quarters. This light weight, versatile American handles all fronts . . . does all jobs with speed, load spotting accuracy that keeps costs low!

"**BEST CRANE GOING**" says Pueblo, Colo., contractor, J. A. Park Machinery Co. about their American 30 ton Truck Crane. They say ". . . it's best in every way." You'll find tough jobs go smoother—every job goes faster with Americans handling the load!



EXCAVATORS-CRANES
to 2 yds.-60 tons
LOCOMOTIVE CRANES
to 130 tons
DERRICKS-HOISTS
to 800 tons
REVOLVER CRANES
to 400 tons

AMERICAN HOIST

and Derrick Company

St. Paul 7, Minnesota

AMERICAN HOIST
PACIFIC COMPANY
Special materials
handling equipment

CROSBY-LAUGHLIN
DIVISION
Drop forged fittings
for wire rope-chain



Pounded over 200 times by air hammer... still not cut!

Even after steady pounding with an air hammer, which delivered 80 pounds of pressure to the chisel edge, Gold Seal air hose was still intact! Think of how much you will save on costly replacements should your operator accidentally hammer Gold Seal for a few seconds... or a trucker dump a load of rock on it... or a tractor grinds over it.

A. COVER: Extremely tough, re-

sistant rubber; resists abrasion, cutting and gouging.

B. CARCASS: Braided steel wire for maximum strength and resistance to extreme impacts. Single braid of nylon cord to insure maximum bonding of cover to carcass.

C. TUBE: Synthetic compound to insure maximum oil resistance. Won't soften or flake.

Write Dept. E. for more information.

Acme Serving
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Since
1870 **Hamilton**

MANUFACTURING CORPORATION, TRENTON 3, N. J.

Divisions: Acme Rubber Mfg. Co. • Hamilton Rubber Mfg. Corp.

ATLANTA • CHICAGO • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES
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Anchored!



...with Talbert's Tandem Stabilizers!*

Proof of performance! This Talbert Dump Trailer was driven on an elevation where one side of the rig was 16 inches above the other!

As the bed was elevated, Talbert's automatic Tandem Stabilizers anchored the rear axles to the frame increasing the rear stabilizing span an additional 61 inches! Only Talbert's

exclusive Tandem Stabilizers* prevented this 20 ton payload of stone from pulling the whole rig over.

PLAY IT SAFE—avoid turn-over damage and costly down-time. Keep them on the job regardless of ground roughness. Get Talbert Dump Trailers with the Tandem Stabilizers!

See your Talbert Distributor for complete details or write to Talbert. Do one or the other today!

*Pat Pend.

Talbert Trailers, Inc.
7910 West 47th Street • Lyons, Illinois

Helicopter picks up a bucket of concrete and heads for the hills where a crew is putting in footings for transmission towers. Airlift saves the trouble and expense of acquiring right-of-way, building a road to the remote site.



RIDING HIGH—Concrete bucket hangs below helicopter, with rope used to discharge it dangling in the breeze. Helicopter delivers 8 to 9 tons of concrete per flying hour.

No Road—So Airlift Brings in

A HELICOPTER whirls down out of the sky, a concrete bucket dangling below it like a pendulum of a grandfather clock. The bucket seems to pull the big machine to earth. But the pilot stops the descent about 25 ft above ground, hovers over a hopper, and discharges the load of concrete.

That's how an enterprising utility company in California is bringing concrete for transmission tower footings into a remote mountainous area where there are no access roads. It's the next best thing to a sky hook.

Southern California Edison Co. is building a 69-mile-long power line through a mountainous region northeast of Los Angeles. They are using helicopters on a five mile stretch in particularly rugged country. Bechtel Corp. holds a cost-plus contract for the work,

which involves placing footings for 15 towers.

SoCalEd tried the helicopters on another job a year ago on a trial basis. But this is their first really serious venture into airlift construction. Helicopters will enable them to string lines over isolated terrain without the expense of acquiring right-of-way and building access roads.

Here's how the airlift operation works. A small Bell 47G-2 helicopter flies in the crew of workmen from the central assembly area to the tower site. Then the 'copter brings in the steel table that holds the concrete hopper. The workmen adjust the legs of the table so that the top is level. Then the 'copter returns with the hopper and sets it in place.

When the crew has a footing ready for a pour, a larger Sikor-

sky S-58 helicopter begins the concrete delivery shuttle service. Two $\frac{1}{2}$ -yd concrete buckets keep the 'copter busy. Transit-mix trucks load the buckets at the landing pasture that is the base of operations. While the 'copter is delivering one bucket, the other is being filled.

When the S-58 arrives at the landing pasture, the transit-mix truck pulls back out of the way, and the helicopter hovers over the full bucket. A workman unhitches the empty bucket and hitches the full one while the 'copter is in the air. A special pickup hook that is being tested on the job is working out well.

The helicopter flies to the tower site with the loaded bucket. A signal man on the ground, working with an observer in the helicopter, guides the bucket over the



OVER THE HOPPER—Signalman on ground, working with observer in helicopter, spots bucket over table-mounted hopper. Crewman pulls rope to dump $\frac{1}{2}$ -yd batch of concrete.

plans to use a new lightweight Gar-Bro instantaneous discharge concrete bucket especially designed for helicopter service. An operator in the 'copter will control discharge of the bucket instead of a man on the ground.

SoCalEd is paying the Okanagan Group, Ltd., of British Columbia \$300 per hour for the Sikorsky S-58 that carries the concrete to the tower sites. In addition, they are renting the smaller Bell machine from Stockton Helicopters, Inc., Stockton, Calif., to haul personnel and hardware.

They're still working out the kinks in the airlift operation. They don't expect to save money on this job, but the experience will be valuable. O. K. Kulberg, Chief Construction Engineer for SoCalEd, says, "Any saving realized now will be just peanuts to what we can save in the future."

Through the use of helicopters, the company can consider locating power lines in completely isolated terrain instead of on more expensive land reasonably close to roads.

Kulberg is looking forward to the development of the Sikorsky S-60, the flying crane. The S-58 that the company is using to carry concrete on this job is not designed for the role. But it is proving that there is a place for the helicopter in construction.

Concrete

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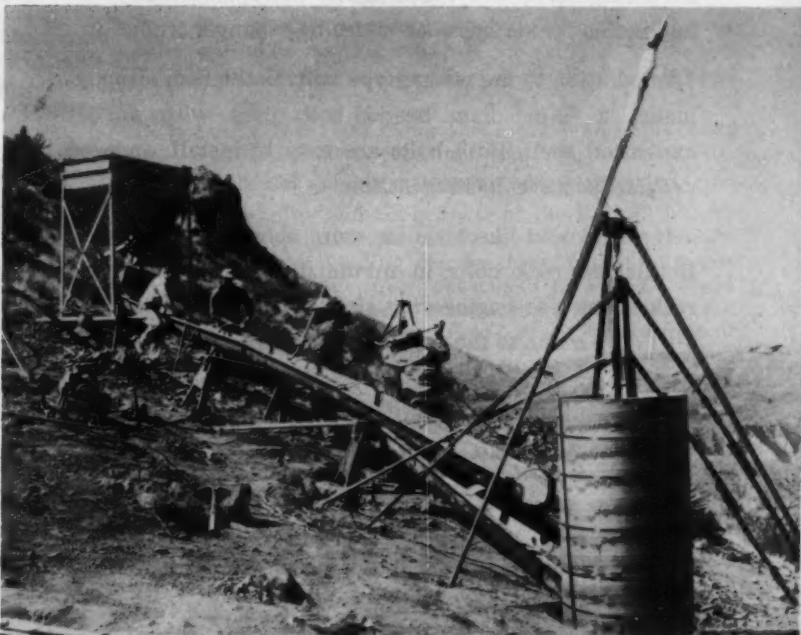
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hopper. When the 'copter is hovering directly over the hopper, a workman pulls the discharge rope that trails from the bucket, and the concrete pours through a short elephant trunk tremie into the hopper.

From the hopper, the concrete flows down a chute into the footings. Sonotube cylindrical forms reinforced with steel strapping hold the concrete at the top of the footings.

It takes about 6 tons of concrete to make a footing for a tower leg. The S-58 averages 8 to 9 tons of concrete delivered per flying hour. In one day—6 hr, 50 min of flying time—the 'copter made 81 round trips between the landing pasture and the tower site and poured 32½ yd of concrete.

For the final tower (14 of them are already poured), Bechtel



POURING A FOOTING—Chutes carry concrete from hopper to footing that will support tower leg. Each footing takes 3 yd of concrete. Sonotube forms hold concrete at top.



1 Wedge is inserted in slotted end of rock bolt. The 1½-in. hole has been drilled previously, to depth 3 in. less than length of bolt.



2 Bolt is inserted through opening in steel anchor plate (rock anchor tie and plate may be used instead), then placed in the hole.



3 Bolt can be driven by same equipment used in boring hole. Dolly protects threads. Wedge drives deep into bolt, spreading slotted portion. Impact wrench is used in tightening nut.



4 With the nut drawn up tightly, the steel anchor plate bears against the rock surface, providing additional support.



**BETHLEHEM
STEEL**



This P&H EL Loader is used by J. E. Haddock, Ltd., Pasadena, California, for a cut and fill operation on the Harbor Freeway extension from Los Angeles to San Pedro, California.

The **P&H** EL LOADER method does a better job, faster...for more "PROFIT-YDS."

Earth moving contractors using the P&H method of loading with the P&H El Loader are loading dirt cheaper than any other method known. They are getting outstanding economy because the El Loader provides unusual maneuverability for faster loading...because the positionable conveyor provides them with the versatility that permits loading any type of hauling unit...because one man, the tractor operator, handles all three operations...raising and lowering the cutting disc and conveyor assembly and operating the conveyor belt.



51" clearance is provided between the conveyor belt and plow beam, and a clearance of 36" between conveyor and main frame, when conveyor is at maximum loading height. This provides ample clearance to handle maximum volume of material.

Check these features that make the C-30A Model P&H El Loader a profit-making investment for you:

1. One-man operation from bank to any hauling unit.
2. Stratified soils can be mixed and blended to a maximum depth of eight feet.
3. Troughing-type conveyor belt is 48" wide to provide maximum loading capacity.
4. Operator can raise conveyor to clear a height of 13 feet.
5. Loads 500-1200 cubic yards per hour—side casts 1000-2000 cubic yards per hour.
6. Easily and quickly dismantled and transported.

The versatility and ruggedness of the P&H El Loader make it applicable for earth moving in any terrain where scraper loading can be done. Combining this with the most economical use of power, the P&H method of loading does a faster job, better and, at the same time, helps you to "Profit-Yards" every foot of the way.

For complete, accurate cost analysis on your job, write Dept. 522B, Harnischfeger Corporation, Construction & Mining Division, Milwaukee 46, Wisconsin.

THE P&H LINE:

Truck Cranes 10 through 70-ton capacity
Crawler Cranes 20 through 100-ton capacity
Excavators $\frac{1}{2}$ yd. through 3½ yds.
Soil Stabilizers from 8 through 12-foot widths—compacted thicknesses from 7 through 12 inches.

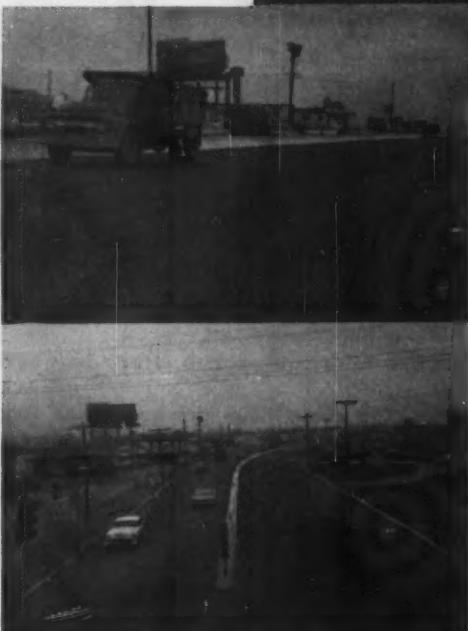


HARNISCHFEGER
Construction & Mining Division
Milwaukee 46, Wisconsin

When traffic demands heavy-duty Asphalt paving

Laying a Texaco Asphalt FABC pavement on New Jersey's State Route 73, approaching the Tacony - Palmyra Bridge over the Delaware River. Route 73 is one of the most heavily traveled highways in south Jersey.

Contractors: Gaskill Construction Company and Union Paving Company.



Close-up of new FABC pavement constructed with Texaco Asphalt on Route 73 and view of completed highway under traffic.

New Jersey's answer is FABC

In New Jersey State Highway Department Specifications, FABC stands for Fine Aggregate Bituminous Concrete. This dense, resilient skid-resistant asphalt pavement has been constructed on heavily travelled primary highways of this state. Over the years its performance has furnished conclusive proof of its rugged durability, economy and unequalled riding quality.

Texaco asphalt has been used in the construction of a substantial mileage of New Jersey's FABC-paved highways and streets. Refined from scientifically selected crudes, Texaco has played an important part in enabling this hot-mix type of asphalt pavement to stand up under heavy, continuous impact, while holding maintenance costs down.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer the road builder a wide range of heavy-duty, intermediate and low-cost types of construction for roads, streets, airports and parking areas. Helpful information on all of these types is supplied in two free Texaco brochures. Copies can be obtained without obligation by writing our nearest office.

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TEXACO ASPHALT

*For a bidding advantage
on that next job...*

CHECK EUCLID'S **BIG 3**

World's most powerful tractor . . . two engines deliver 425 net h.p. to power trains . . . separate Torqmatic Drives and full power shift . . . independent track drives . . . 27" standard shoes . . . 8 track rollers . . . fast, easy operation . . . excellent accessibility for servicing.

Unequalled work-ability for push-loading big scrapers, bulldozing and ripping earth, rock, coal and ore, towing heavy equipment and other big tractor jobs.

TC-12
TWIN-POWER
CRAWLER



All-wheel drive . . . two engines with a total of well over 500 h.p. . . . separate Torqmatic Drives . . . 24 cu. yds. struck . . . 32 yds. heaped . . . independent hydraulic controls . . . NoSpin differentials . . . 27.00 x 33 tires with 33.5 x 33 optional.

Moves the cheapest dirt on big, tough jobs as well as small yardage projects . . . works under adverse conditions that stop other scrapers.

TS-24
"TWIN"
SCRAPER

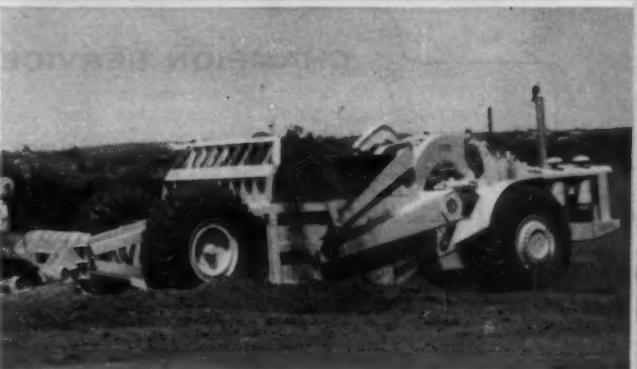


30 cu. yds. heaped . . . 21 yds. struck . . . 336 h.p. engine . . . 4-speed Torqmatic Drive with converter lock-up . . . independent hydraulic controls for bowl, apron and ejector . . . structural strength for push-loading by biggest tractors . . . exceptional service accessibility.

Years-ahead design with proved productive capacity that outperforms every other big scraper in its class . . . dependability that cuts downtime and maintenance costs.

EUCLID Division of General Motors, Cleveland 17, Ohio

S-18
SINGLE
ENGINE
SCRAPER



Big Power...Big Capacity...Big Performance for Bigger Return on Investment!



EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



Champion representative works with fleet mechanic, checking for proper installation of front wheel static collectors in radio-equipped truck. (See Service Tips)

EXCLUSIVE TECHNICAL HELP

Only Champion offers your fleet this expert technical help. At your request, a Champion representative will call to help you improve ignition performance and cut maintenance costs. Working in your shop, he'll pass along to your mechanics the latest techni-

cal "know how" from Champion—the world's largest organization devoted exclusively to spark plug development. This exclusive technical help is available—free. Put it to work for *your fleet*. Just call your Champion representative or supplier, or write Champion at Toledo 1, Ohio.

CHAMPION SERVICE TIPS

FOR RADIO- EQUIPPED FLEETS

Champion resistor-type spark plugs (identified by "X" prefix, such as XJ-6, etc.) are recommended to reduce ignition noise in two-way radio-equipped vehicles. If static persists after installing Champion resistor spark plugs, check for the following causes—

First, turn on the radio and bump it with your hand to see if loose tubes or connections are causing the trouble.

Extend the antenna to full length. Adjust the antenna trimmer by tuning the set to full volume and rotating the trimmer control to obtain the loudest possible volume.

Check the antenna and lead-in. Make sure the antenna has good ground contact by tightening the mounting nut until the nibs of the base plate bite through the paint into the body metal. (If you think the antenna or lead-in has a short, test by plugging in a substitute antenna.)

Check for proper condensers at the regulator and generator armature terminals.

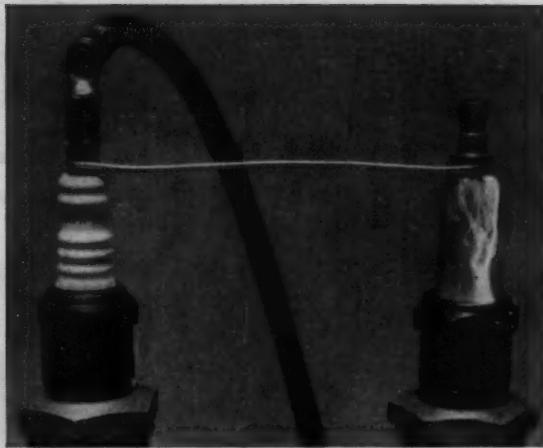
See that the front wheel static collectors are installed. Make certain a ground strap is installed between the engine and body, with good metal-to-metal contacts.

Put this Champion "know how" to work for your fleet



SPECIAL APPLICATION PLUGS

Champion resistor-type spark plugs reduce ignition noise in two-way radio-equipped vehicles. In many resistor plugs, heat pushes resistance too high or too low. Plugs misfire, or ignition noises come through. Champion resistor spark plugs reduce noise and fire smoothly at all engine temperatures!



EXCLUSIVE PRODUCT FEATURES

In this photo, both spark plugs have the same voltage applied. See how Champion's exclusive 5-rib ceramic insulator gives far greater protection against "flash-over" shorting! That's why you get faster starting and longer battery life when you use full-firing Champion spark plugs in all your vehicles.



SERVICE AIDS

Champion "Plug-Master" wrenches and "Plug-Mate" magnetic sockets ($\frac{1}{2}$ "") get at hard-to-reach plugs faster and easier. Cut down your maintenance costs by speeding up spark plug service. Order enough of these handy, knuckle- and time-saving tools to go around your shop. Check your regular Champion supplier for details.



18 of 21
truck makers install



CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO

Shale that rebounds like rubber when overburden is stripped off makes it necessary to excavate a deep foundation a bit at a time, sealing off the exposed shale and pinning it down fast.

A RUBBER-LIKE formation of Pierre shale makes construction of the powerhouse at Oahe Dam a bite-by-bite affair.

Because the shale rebounds like rubber—it rises as much as 2 ft when overburden is stripped off—the contractor has to excavate pits for the generators a bite at a time, weighing the exposed shale with concrete within 48 hours after excavation.

It wouldn't be so bad if the shale were solid and monolithic. But it isn't. The formation is riddled with fault planes in a crazy pattern of fractures and fissures.

The result is extreme instability. Almost anything can trigger a slide. Excavation can throw the delicately poised blocks off balance. Water seeping into cracks acts as a lubricant. Air exposure causes drying and shrinkage. All these factors make the situation ticklish.

Nails Shale Down Fast

So after each bite is opened up, the contractor has to get in and seal the shale off, weight it with concrete, and nail it down with anchor bolts drilled through the concrete base slab.

It's an upside down job. Concreting starts at the top instead of at the bottom. Anchor bolts are placed underfoot to keep the shale from rising, instead of overhead, as in a tunnel, to keep rock from dropping.

"It's like hanging by your heels and working upside down," says E. G. Libert, project manager in charge of the powerhouse substructure for the combine that is handling the \$4-million job. The combine consists of Winston Brothers Co., Minneapolis, Minn., Green Construction Co., Des Moines, Iowa, and Johnson, Drake & Piper, Minneapolis.

The powerhouse foundation measures 162 x 530 ft. Each of the seven generator bays is 126 x 76 ft. The contractor cuts out the shale in each bay to a depth of 37 ft. Side slopes of the pits housing the generators are at about 45-deg angles.

The quantities are substantial.

Rubber Shale



FROM THE TOP DOWN—Concreting starts at the top of the excavation. Contractor digs down about 7 ft at a time and covers the exposed shale with concrete within 48 hours.

Excavation totals 131,000 yd³; concrete to be placed totals 72,850 yd³. But what makes it tough is the restrictions written into the specs on how much work can be done at one time.

Specifications restrict excavation at any one time to not more than three generator bays, only two of which can be adjacent. Tendency of the shale to rebound is limited when only a small area is unloaded at a time. But the requirement severely cuts working room.

It all adds up to a complex challenge in job planning. Operations — excavation, concreting, drilling — shuffle in and out in what could be a confused tangle. But the contractor is dovetailing operations efficiently, and the job is moving along smoothly.

Lifts Are Limited

The excavation proceeds downward in a series of 6 or 7-ft lifts. Size of the lifts is limited so that the shale can be covered with concrete within the 48-hr time

Turns Job Upside Down



DEEP PIT—One of seven 37-ft-deep pits that will house generators at Oahe powerhouse. Concrete slab serves as platform for

drill rigs boring holes for anchor bolts that will hold shale down. Rig with tilting mast drills holes at varying angles in inclined faces.

limit. A 2½-yd P&H 955 shovel does the rough excavation. A 1½-yd Manitowoc backhoe handles the finish grading.

When the rigs are excavating two bays at a time, trucks go into the pit. On single bays space is so tight that there is room only for the backhoe. It finishes up as it backs out.

As soon as each lift is dug out, the contractor applies a bituminous sealing solution to the exposed rock to seal it off from moisture. Specs require that the

shale be sealed within two hours of excavation.

A Bucyrus-Erie 54-B crane with 2-yd bucket places the concrete for the 4-in.-thick base slab. Ordinarily the contractor gets the concrete cover on top of the shale within 24 hours after excavation. That takes the pressure off because it greatly reduces the danger of rebound.

Then the drill rigs move in to bore the holes for the anchor bolts that pin down the shale permanently. The concrete slab

forms a platform for the rigs. A failing drill rig bores the holes into the flat bottom of the trenches. The contractor had to bring in a special rig to bore the holes into the sloping sides of the pits.

Winston-Green-Johnson tried to subcontract the drilling for the anchor bolts. They brought in a succession of drilling specialists to figure the work. But they didn't get even one bid; all the specialists declined to tackle the job.

continued on next page

only a
Snap-TY
gives you
all this

1 Full-size Rod (.225 diameter) for maximum strength.

2 Offset Type Flats for better anchorage to prevent turning.

3 Upset behind spreader washer for positive wall size (loose or restrained washers optional).

4 Durable, malleable iron TY-Holder that is bottom-heavy and ribbed for stability. Needs no nailing!!

5 Well-formed Heads. No interference from die marks. A quality tested, precision-built TY.

6 Uniform, flat-surfaced Head Washer that insures proper bearing.

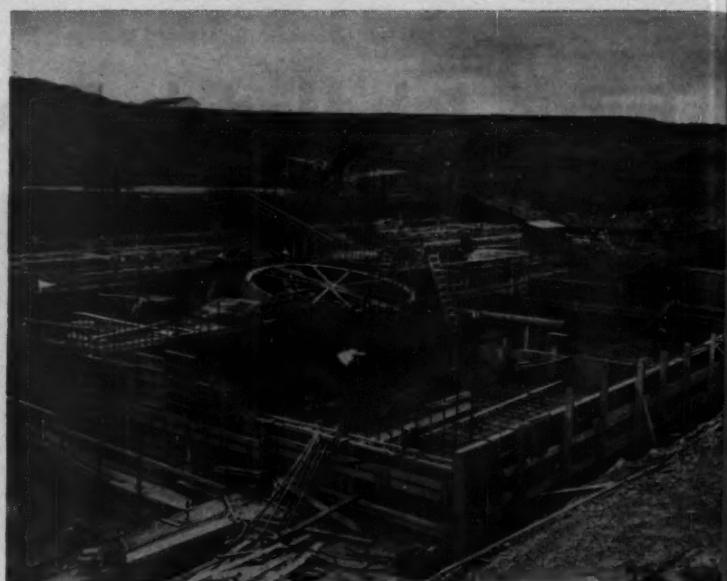
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Snap-TY

Over thirty types of Snap-TYS are available—a type for every need. And all are proved, tested products with Richmond's 46 years of experience behind them.

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RUBBERY SHALE . . . continued



FOUNDATION—When 45% of the massive substructure concrete is in place in first three bays, excavation starts in adjoining bays. Job will take about 72,000 yd of concrete.

The reason for their disinterest is obvious. The powerhouse excavation is an irregular geometric shape with planes occurring at five different angles. The angles vary from horizontal to 45 degrees. The anchor bolts are placed perpendicular to the differing planes of the foundation. Conventional drill rigs cannot handle the multiplicity of angles.

A specially designed drill rig that placed anchor bolts for the Fort Randall Dam, 200 miles downstream, took the combine off the hook. The rig was built as a one-shot proposition, but Winston-Green-Johnson moved it to the powerhouse pit when they found that it met the job requirements nicely.

The rig's drilling table is fixed to the mast; angle of hole is achieved by tilting the mast. The rig's tower is retractable so that it can be lowered for moving. It can also be cranked down low enough to handle the powerhouse holes.

The drill completes two holes at each setting. The 6-in. holes are 20-ft deep. There are 4,000 holes altogether. Spacing is about 5 ft. The anchor bolts are 1 7/16-in. They are grouted into the holes that are belled to 18 in. at the bottom.

When the anchor bolts are in place, the contractor pours the massive concrete that forms the

substructure of the powerhouse. When 45% of the substructure concrete is in place in the first three bays, the contractor is then allowed to start excavation in the adjoining bays.

The job is one of two major ones being carried out at Oahe by the combine. The same corporate lineup, with the addition of American Pipe and Construction Co., Los Angeles, Calif., and Foley Brothers, Inc., St. Paul, Minn., holds a \$13-million contract for the downstream power tunnels of the dam.

Men on the Job

Project manager in charge of both the powerhouse substructure and the downstream tunnel is G. Libert. Assisting him is T. A. Leines. Project engineer for both jobs is Walter Heistand. E. D. Feurt is administrative manager. Carpenter superintendent is H. Measley; Lloyd Sprague is concrete superintendent.

Oahe Dam is being constructed under the supervision of the Omaha District Office of Army Engineers. Col. David G. Hammond is district chief. Jerome C. Ackerman is chief of engineering. Edward Soucek is chief of design and S. L. Price is chief of construction. Area Engineer for the Oahe project is John Silbert, Jr. Resident Engineer is Al Arrington.



...more profit with every pass



DOES YOUR JOB REQUIRE A 7 YARD UNIT?



CURTISS-WRIGHT MODEL

27

CW-27 SELF-PROPELLED SCRAPER

Capacities: 7 cu. yds. struck, 10 cu.
yds. heaped, 26,000 pound rated load

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If it does, then your job requires the CW-27 . . . This 7 yd. struck, 10 yd. heaped, self-propelled scraper meets all small yardage requirements—sets a fast 30 mph haul pace on small clean-ups or

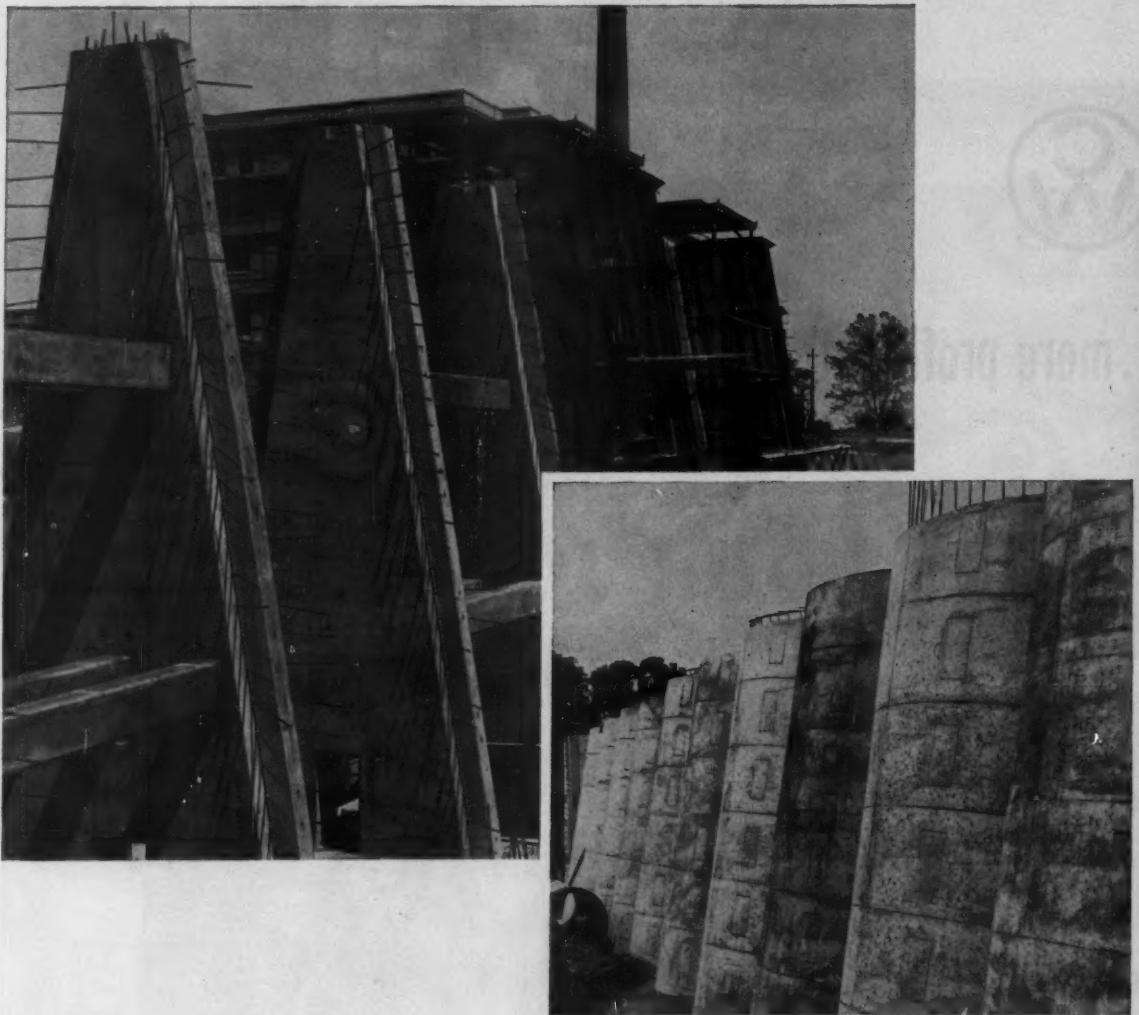
big yardage projects . . . Like the entire line of Curtiss-Wright 'plus-yardage' scrapers, the CW-27 boasts such maintenance and production advantages as unit construction, Roto-Gear steer, constant live winch and positive roll-out ejection . . . To insure the utmost from every scraper, Curtiss-Wright engineers to the contractor's requirements . . . To be sure you get the most from all your jobs, check with Curtiss-Wright first!

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SOUTH BEND DIVISION

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SOUTH BEND, INDIANA



LACLEDE STEELS reinforce unusual new water storage basin

Nine hundred and twenty-eight tons of Laclede multi-rib round reinforcing bars and other Laclede steel reinforcement are being used in a unique type of water storage basin now under construction at the Chain of Rocks Station, St. Louis City Water Department.

This will be an underground clearwater basin, where approx. 10,000,000 gals. of purified water will be stored before distribution to users in the St. Louis area. Unusual feature of the basin is the construction of its walls, formed by 60 huge cylindrical concrete shells, interconnected so that inspectors may examine the interior of the walls for the entire length.

Developed by E. E. Easterday, chief engineer for the St. Louis water department, this patented design provides a virtually foolproof barrier against contamination by ground water seepage.

Approximately 11,500 cubic yards of concrete will be used in the new basin.

General contractor on the project is G. L. Tarlton Contracting Co., St. Louis, and engineers are the Water Department, City of St. Louis.



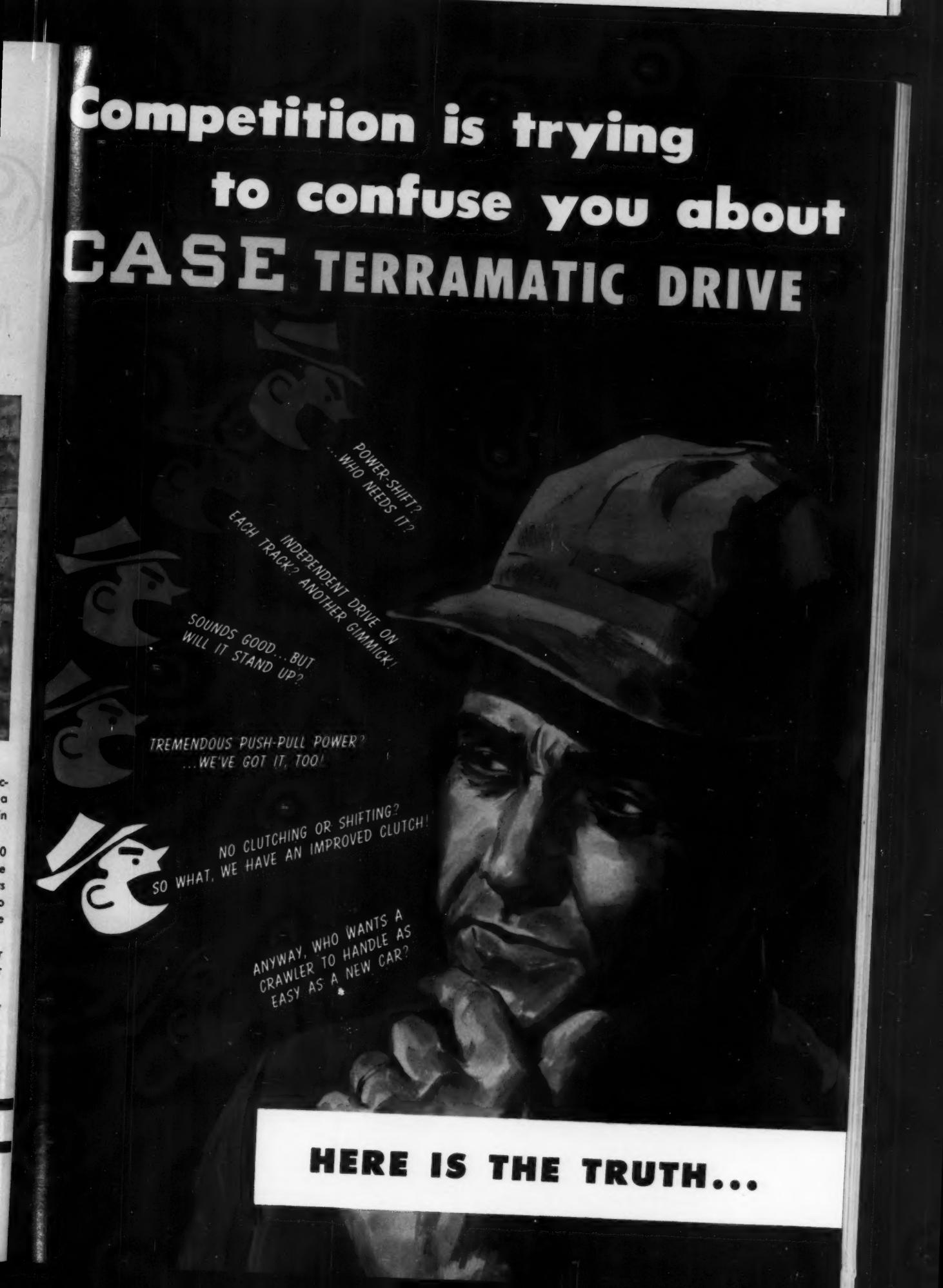
LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI



Producers of Steel for Industry and Construction

Competition is trying to confuse you about **CASE TERRAMATIC® DRIVE**



POWER-SHIFT?
WHO NEEDS IT?
INDEPENDENT DRIVE ON
EACH TRACK? ANOTHER GIMMICK!
SOUNDS GOOD...BUT
WILL IT STAND UP?

TREMENDOUS PUSH-PULL POWER?
...WE'VE GOT IT, TOO!

SO WHAT, NO CLUTCHING OR SHIFTING?
ANYWAY, WHO WANTS A
CRAWLER TO HANDLE AS
EASY AS A NEW CAR?

HERE IS THE TRUTH...

No matter what you may have heard... Here are the answers to your questions about **CASE TERRAMATIC® DRIVE**

What is Terramatic Drive?

It is an ingenious "marriage" of an exceptionally efficient torque converter, with 4-speed, constant-mesh, gear transmission, which is actuated by hydraulic clutches and controlled by simple hydraulic valve-levers.

What are the specific advantages of the Terramatic Transmission?

It gives you *effortless power-shifting* from forward to reverse, or from one speed to another — without clashing gears. It also provides greatly increased ease of maneuverability because each track is *independently* power-driven by a separate set of hydraulic clutches. Operator can either stop one or both tracks with powerful double-disc hydraulic brakes . . . flip one track control-lever into *high* and the other into *low* speed . . . or run one track *forward* and the other track *reverse* at same time.

What are the functions of the torque converter?

The torque converter, in reality, is a *secondary* hydraulic transmission, with an *infinite* number of speed ratios. It senses the load . . . instantly and automatically increases push-pull power up to 100% as needed — *without clutching, shifting or stalling*. It also

"cushions" jolting shocks, keeps engine and hydraulic pump running at *full rpm* — *regardless of load* — to insure maximum efficiency in operating bucket or dozer blade.

Does Terramatic Drive actually increase crawler output?

Yes. Certified owner reports indicate that, on *comparable* digging and dozing jobs, the 80 and 100 HP Case crawlers, with Terramatic Drive, are consistently outproducing competitive clutch-type rigs by as much as 50%.

Does Terramatic Drive cost more to operate?

No. Because the torque converter operates *automatically*, travel speed and working load are always in perfect balance, for *greatest possible work output per hour and per gallon of fuel*. Operator never has to "gun" the engine, slip the clutch, or "guess" whether he is in the right gear for most efficient operation. It's all automatic!

Does Terramatic Drive reduce operator fatigue?

Yes. Compared with conventional clutch-type crawler tractors, the torque converter alone *eliminates up to 300 back-straining pulls per hour* on a stiff

clutch-lever. In addition, smoother riding qualities, plus power-steering and convenient foot throttle help keep operator working steadier, happier, with less fatigue.

Will the Terramatic Transmission stand up as well as a conventional gear transmission?

Yes, even better. In fact, as a result of more than 2 years of field experience, on thousands of construction, mining and logging jobs, J. I. Case Company now issues a *full year service warranty* on the Terramatic Transmission used in all Case Model 800 and 1000 crawlers. This is *double* the warranty offered by any other manufacturer of tractor transmissions.

We hope your questions have been answered and that you now have a better understanding of why

CASE Terramatic Drive performance and convenience can't be matched

*Only Case
Terramatic Drive
gives you all 3*

No other crawler manufacturer can offer you the combination of features available in a Terramatic Drive tractor. This job-proved drive not only offers a fully automatic torque converter, it also gives you the added advantages of instant power-shift and independent track control, for increased speed and maneuverability.



1 FULLY AUTOMATIC TORQUE CONVERTER FOR DOUBLE THE PUSH-PULL POWER

Job-proved Case Terramatic Drive senses the load and increases torque up to 100% — instantly, precisely, automatically — as needed. No clutching, no shifting, no stalling. You automatically operate in highest possible working range.

2
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2 INSTANT POWER-SHIFT FOR HIGHER OPERATING SPEEDS

You change speeds or direction on-the-go, without clashing gears. Reverse speeds are twice as fast as conventional crawlers. Easy-working hydraulic controls and handy foot-throttle give operator positive, effortless control at all times.

3 INDEPENDENT TRACK CONTROL FOR UNPRECEDENTED MANEUVERABILITY

Operator can make conventional pivot-turns, power-turns, or counter-rotating turns, merely by flipping hydraulic levers, or by touching hydraulic foot brakes. One hand is always free to operate loader or dozer controls.

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CASE

Terramatic® Drive

doubles push-pull power...
instantly... automatically
gives unprecedented speed
and handling ease

See your **CASE** Dealer
for a demonstration

You be the sole judge. Prove to your own satisfaction... on your own job... doing your own work... that a modern 80 or 100 HP Case crawler, with Terramatic Drive, can do up to 50% more work than any conventional crawler in its price range. ACT NOW! Make a demonstration date today.

short of cash?
don't let that stop you!

Your nearby Case Industrial Dealer will gladly arrange an easy monthly financing or lease plan, with seasonal skip-payments, to fit your budget. See him today.

MAIL to J. I. CASE CO., Dept. E1499, Racine, Wis., U.S.A.

Send free descriptive literature on items checked:

- Model 800 or 1000 Terramatic Drive crawlers with
 - 1½ or 2-yd. Tractor-Shovel
 - Power-Angling Dozer
 - Hydraulic Tilt-Crown Dozer
- Model 600 crawler with
 - M-3B Fork Lift
 - 420 Wheel Backhoe-Loader
 - M-420 Fork Lift
 - W-5 TerraLoad'r
 - W-9 TerraLoad'r
- Model 520 crawler with
 - Model 420 crawler with
 - M-3B Fork Lift
 - 420 Wheel Backhoe-Loader
 - M-420 Fork Lift
 - W-5 TerraLoad'r
 - W-9 TerraLoad'r

Name..... Title.....
Company.....
Address.....
City..... State.....

10 TRACTOR MODELS 50 Equipment Combinations

1000 100 HP* Diesel with exclusive Terramatic Drive, torsion-bar suspension, automatic track lubrication.



800 80 HP* Diesel with exclusive Terramatic Drive, torsion-bar track suspension, automatic track lubrication.



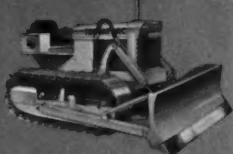
600 62 HP* Diesel or Gas, with torque converter, 4-speed hydraulic power-shift transmission and power-steering.



520 50 HP* Gas, or 45 HP* Diesel with torque converter, 3-speed gear transmission and improved total-contact differential steering.



420 42 HP* Gas with ferrometallic clutch, 3-speed gear transmission and improved total-contact differential steering.



M-3B 3500-lb. capacity fork lift, 9', 14½" or 21½" mast, 50 HP* Gas engine with torque converter, 3-speed gear transmission and improved total-contact differential steering.



420 47 HP* Gas with torque converter, 8-speed shuttle transmission, power-steering.



M-420 4000-lb. capacity fork lift, 9½", 14¾" or 21½" mast, 47 HP* Gas engine with torque converter, 8-speed shuttle transmission and power-steering.



W-5 TerraLoad'r, 3000-lb. capacity, front-wheel drive, rear-wheel power-steer. 1-cu. yd. bucket. Gas engine with torque converter, shuttle-shift.

CASE
J. I. CASE CO., RACINE, WIS.
World-wide sales and service



W-9 TerraLoad'r, 6000-lb. capacity, 4-wheel drive, rear-wheel power-steer. 1½, 1¾ or 2½-cu. yd. bucket. Gas or Diesel engine with torque converter, power-shift, power-transfer differential.

*Gross engine flywheel H.P. sea level (calculated) max. H.P. (based on 60° F and 29.92" Hg). Mfr's. rating. Nebraska test not yet available.

DITCHER CUTS CANAL—Gar Wood-Buckeye 330 cuts a 12½-ft-wide trapezoidal ditch at rate of 8 ft per min for irrigation canal.



Rig Cuts and Concretes Canal

THIS BIG DITCHER kills two birds with one stone. It cuts out an irrigation canal at a rate of 800 cu yd of material per hour; and it pulls a slip-form paver that lines the canal. Like ribbon unwound from a spool, the big machine can unreel up to 35 ft of completed ditch per minute.

Now working on an irrigation project in the Rio Grande Valley of Texas, the giant 55-ton ditcher is the Gar Wood-Buckeye 330. It's

probably the world's largest production-model ditcher. The Water Board of Cameron County, Tex., bought the rig to rebuild a 50-year-old irrigation system.

The job involves replacing some 135 miles of dirt canals with concrete-lined canals or concrete pipe. The project will be spaced out over a five-year period in order to prevent interruption of irrigation service.

First phase of the work is re-

placing a two-mile section of one of the main irrigation canals. A dragline built up a levee, and sheepsfoot rollers compacted it solidly. Then the ditcher began cutting the new canal along the top of the levee.

On this job the big rig cuts out a ditch that is 12-ft, 4-in. wide at the top, with a 31-in.-wide flat bottom. The ditcher is equipped with 52-in. buckets. (It can handle 65-in. buckets.) It moves at an average rate of 7 ft, 9 in. per minute, spewing out 1½-yd of material per foot.

Paver Rides Behind

A long cable attached to the rear of the ditcher pulls a Fuller slip-form paver along behind it in the excavated ditch. When the ditcher is not running, a winch mounted on the paver tugs it along the ditch. The ditcher then acts as a deadman. When the ditcher is running but it becomes necessary to stop the paver, the winch is simply put into reverse and the cable allowed to pay out. Normal operation is for the ditcher to pull the paver with the winch out of gear.

The concrete lining of the ditch is 2½-in. thick. Transit-mix trucks bring in concrete to the site. A crane with 1½-yd bucket feeds the concrete into the slip-form.

A Caterpillar 220-hp diesel en-



PAVER LINES CANAL—Ditcher ordinarily pulls Fuller slip-form paver with cable. But winch on paver can pull it when ditcher stops or pay out cable to stop paver if necessary.

RIG CUTS AND CONCRETES CANAL...continued



ON THE LEVEE—Big dumper gouges out canal on top of levee built up by dragline and compacted with sheepfoot roller. Grader evens up fill in front of lumbering giant.

gine powers the ditcher. It is equipped with Allison Torque-matic three-speed transmission and Allison torque converters.

Cuts Any Size Ditch

The rotary side cutter can be modified in the field to vary the width and depth of the cut. The rig can cut a trapezoidal ditch up to 22 ft wide. For pipeline or sewer jobs the ditcher can dig a rectangular ditch up to 5½-ft-wide and 11-ft deep. In this type of operation the ditcher has hit speeds as high as 35 ft per min.

Spoil can be discharged from both sides of the machine simultaneously, or from one side at a time. Hydraulically operated dual conveyors—one at each side—handle the material.

This project is the first in the country to be authorized under the Small Reclamation Projects Act of 1956. Administered by the Bureau of Reclamation, the act is planned to encourage state and local governments to initiate water conservation projects costing less than \$5 million.

More capacity...size for size!

Crosby-Laughlin Load-Rated[®] Shackles

*Designed to new
safety standards*

- Heat treated bows
- Heat treated alloy pins
- Guaranteed capacity
- 50% stronger than ordinary shackles
- Safe working load forged in every shackle

Stocked and sold by leading mill supply, construction and industrial equipment distributors.



Write for FREE specifications catalog listing the most complete line of drop forged fittings for wire rope and chain.

*Trademark

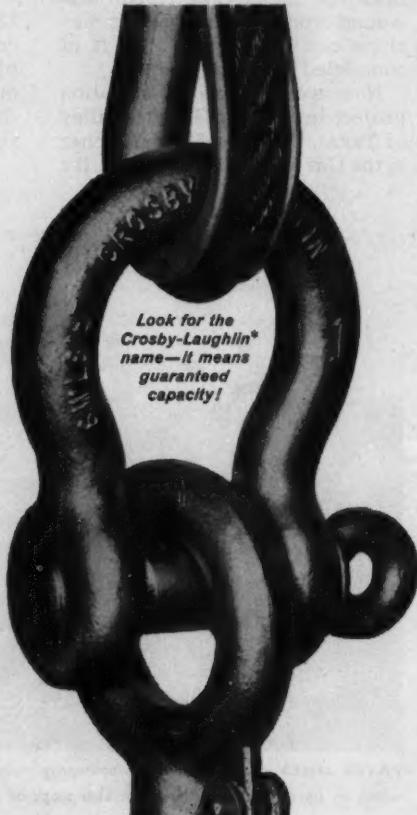
Look for the
Crosby-Laughlin[®]
name—it means
guaranteed
capacity!



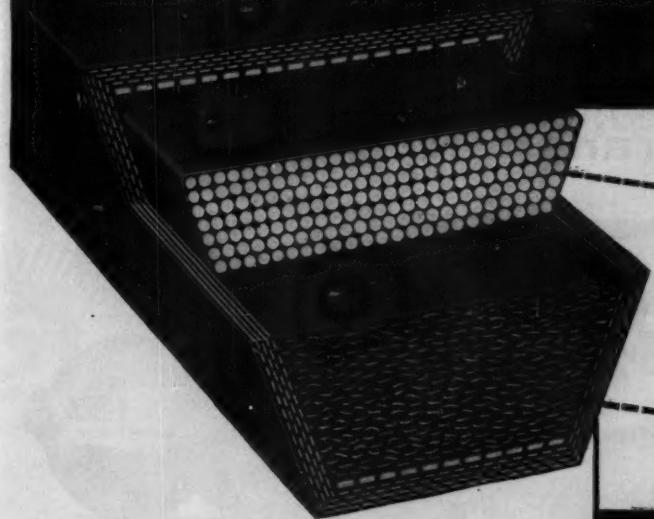
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Manufacturers of Crosby Clips and "Load-Rated" Blocks . . . Crosby-Laughlin
"Load-Rated" Fittings . . . Lebus Load Binders and Snatchblocks.



NEW! Only BOSTON V-Belts are made with



DACRON
Tensile Members

plus

NEOPRENE with
FIBER-DISPERSED Stock!

DACRON Tensile Members

GREATER STABILITY — Changes in humidity — and the resulting moisture regain — often mean a matching problem with ordinary V-Belts. The moisture regain of DACRON® is low — 0.4% — or 1/20th that of the conventional reinforcing fiber. This means far less time spent in matching, and lower belt inventory too. Because V-Belts reinforced with DACRON are more uniform, each belt carries an equal share of the load.

HIGHER STRENGTH — Stronger belts can withstand more shock loading, need less maintenance. DACRON is approximately 40% stronger than the conventional fiber used in V-Belts.

STRETCH RESISTANCE — V-Belts reinforced with DACRON have low stretch. DACRON is inherently stretch-resistant and the cords are put through a special heat and tensioning process to further minimize stretch. Thus, belts reinforced with DACRON show comparatively little growth — even after many months of continued operation.

*DACRON — DuPont polyester fiber

The industry's most advanced developments are now standard in the entire Boston Multiple V-Belt line!

NEOPRENE with FIBER-DISPERSED Stock

GREATER RESISTANCE to oils, heat, abrasion, chemicals and ozone is provided by Neoprene.

HIGH TRANSVERSE RIGIDITY is provided by the closely-packed, straight-line formation of the fibers in the compression member.

EXCEPTIONAL LONGITUDINAL FLEXIBILITY is provided by the virtually frictionless positioning of fibers.

EXTRA SUPPORT for the tensile members during shock-load impact and during normal operation.

WITH NEW BOSTON MULTIPLE V-BELTS YOU CAN:

- CUT DOWN MAINTENANCE
- SAVE MATCHING TIME
- MAINTAIN SMALLER INVENTORY
- SAVE TAKE-UP TIME

BOSTON

BOSTON WOVEN HOSE & RUBBER COMPANY
DIV. OF AMERICAN BILTITE RUBBER CO., INC.
BOSTON 3, MASS.

**Here's a *Safe* and *Simple* way
to load . . . unload
and transport**



Construction equipment gets bigger, harder to load and certainly more costly. So what better reasons are there to choose the fast, safe and simple front-end loading and unloading provided by LACROSSE Removable Gooseneck Trailers.

First, consider LACROSSE Removable Gooseneck design: both ends of the gooseneck have standard kingpin and fifth wheel hook-up . . . fool-proof, positive locking so familiar to everyone. This design —without the use of winch, power or hydraulic attachments—permits loading and unloading to be

accomplished in the three safe and simple steps illustrated below.

Important, too, running gear and brakes on these Removable Gooseneck Trailers are LACROSSE designed, engineered and manufactured . . . your assurance of generous overload strength and support. Units available with capacities of from 25 to 75 tons payload. Options of flat deck, drop side deck or beam deck design. Two and three axle models. Get the full facts from your LACROSSE Dealer or write for the brand new brochure No. RG-2560.

① Release tractor kingpin connection and pull away; trailer gently lowers to the ground.

② Swing hinged stirrups on gooseneck to up position and back up tractor till upper kingpin locks in tractor's fifth wheel.

③ Release lower kingpin from trailer fifth wheel and tractor pulls away with gooseneck. As simple as 1-2-3!



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SERIES 350 BANTAMS



BANTAM T-350—11-TON CAPACITY—choose from four all-new, husky BANTAM-built carriers of highest mobility and working stability for precisely what your job and budget needs call for. Three types of boom hoists. Power load lowering. Standard, 2-speed or torque converter transmission. House-type or all-vision cab. Remote control, too.

The Profit-Making Bid Winners!

You would expect it—the very tops in earning power from an *all-new* BANTAM series. Here is combined the most progressive thinking in up-to-the-minute crane-excavator engineering with the most thoroughly proved design. Behind the new BANTAMS stands the record of nearly 9000 machines customer-approved all over the world.

Look at the facts:

BANTAM gives you the job-bidding edge because size for size, there is nothing else so capable, so rapid-working or so versatile!

These are a few of the all-new BANTAM advantages: greater horsepower, gas or diesel . . . increased line pulls . . . unexcelled-in-its-class crane ability, with booms to 70' and jibs to 15' for greatest capacity at *usable* working radii . . . new, deeper-

digging back hoe (optional) . . . choice of four rugged carriers *all* BANTAM-built for BANTAM crane-excavator service . . . instant-acting, lastingly trouble-free mechanical controls that make all operators quick experts. Now add BANTAM's famed penny-pinching operating costs—less fuel, less maintenance, less down time—and you're sure to be the winner of more jobs . . . and net more profits from each one!

And remember, BANTAM is the *all-job rig*—it mounts 11 versatile BANTAM-built attachments to put you in the preferential position to get and earn from the widest range of work!

See the new BANTAMS . . . let your BANTAM distributor point out how you can now custom-make a BANTAM to your exact work and price needs through the greatest selection of equipment options ever offered.



BANTAM C-350—7.8-TON CAPACITY—stronger, more rigid car body with standard and long side frame sizes. Wide base extensions and high-clearance side rails. Full reversing, 2-speed travel transmission and new optional in-cab digging lock. New, optional long-boom back hoe offers 18'10" digging depth.



BANTAM CR-350—11-TON CAPACITY—1-man, 1-engine travel and work efficiency. An all-purpose digging, lifting, materials handling tool for contractors, aggregate producers, municipalities. New 4 x 4 drive . . . new automotive-type power steering . . . independent travel, swing and hoist . . . faster travel speeds . . . bypassing box-beam outriggers for all-around stability.



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29,000 lbs. - and all muscle!

Bring on those gruelling, earth-moving, profit-making jobs and just watch this mighty Dodge D800 dump truck clean them up.

It weighs in at 29,000 lbs. maximum G.V.W. It's big and tough. It's packed with power and the right equipment to get the job done in short order. Special transmission, if you need it—special axle, springs, brakes—whatever your kind of trucking requires.

Big-load hauling was never easier . . . never more profitable . . . than in new, improved '59 Dodge "Job-Rated" heavy-duty trucks with G.V.W.'s to 49,000 lbs., G.C.W.'s to 65,000 lbs.

Your Dodge dealer has full information. He'd like nothing better than to talk to you, and tell you why . . .

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it's real smart
to choose **Dodge**
Trucks



To provide maximum flexibility in loaded, off-road service and at unloaded highway speeds, a 4-speed auxiliary transmission is now offered for all conventional and tandem models in the Dodge 800 and 900 series. Another benefit for more truck buyers!



STARTLING CONTRASTS in construction methods show up often in overseas construction work. On a current harbor construction job in Kuwait, on the Persian Gulf, for instance, the American contractors have set up one of the biggest and most efficient concrete prestressing plants in the world. But the aggregate for the plant is gathered by hand by wandering Bedouins who put each stone into saddle baskets on their donkeys and haul it to collection points.

The Kuwait job is an excellent case history of how a smart contractor can combine the best of American construction know-how with centuries-old local practices to produce a unique but effective operation.

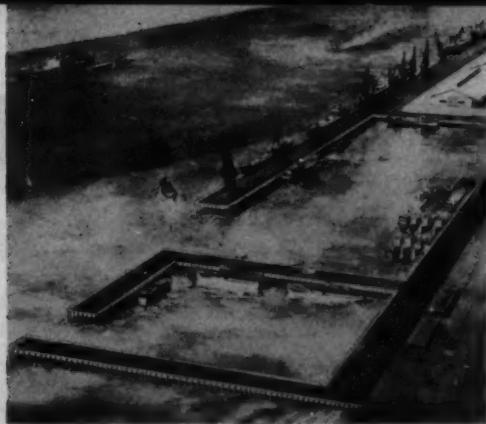
The outstanding feature of the job is, of course, the prestressing plant. With an annual capacity of nearly 75,000 cu yd of prestressed concrete, it is larger than all but a very few plants in the United States.

The job requires 370,000 sq ft of deck and more than 5,300 piles. All are precast and prestressed. It is one of the largest applications of prestressed concrete to pier construction in the world, and it's the first application for this type of work in the Middle East.

Pomeroy - Hawaiian Dredging-Kuwait International have a \$24-million contract to build a seaport for the Government of Kuwait. When completed in 1960, Kuwait will have, in addition to its oil shipping ports, the finest deep water, dry cargo port on the Persian Gulf.

The main elements of the harbor are 4,850 ft of marginal wharf, 2,000 ft of finger piers, and four 11x440-ft steel frame transit sheds. Wharves, piers, and buildings all are founded on prestressed concrete piling.

Pomeroy - Hawaiian Dredging now are working on the 2,500x75-ft main wharf. They are putting in 24 lin ft of wharf per day on the average. At the same time they are dredging 3,600,000 cu yd of material from the water in front of the wharves. Of this volume, 1,500,000 cu yd goes behind the wharf area to provide new land for harbor development.



One of the world's biggest prestressed concrete plants is smoothly turning out 5,300 piles and 370,000 sq ft of deck slab for a major harbor development in Kuwait on the Persian Gulf. The set-up combines the most advanced U. S. know-how with centuries-old Arab methods—a fine example of smart overseas construction work.

U. S. Contractors Combine Methods, Arab Labor to Build Port in the Mid-East

Prestressing Yard

The contractors designed the prestressing yard specifically for Kuwait. They eliminated complicated equipment and specialized skills wherever possible. This made it easy to teach simple, repetitive tasks to inexperienced native workmen.

They planned the entire layout down to the last detail before the equipment ever left the United States. Major items were tested to make sure they would perform as intended.

In at least one case this pre-testing saved a lot of trouble on the job. A pilot set of forms for the deck slabs had been fabricated from a preliminary design. They were erected at the Ben C. Ger-

wick, Inc., precasting yard at Petaluma, Calif., and a full scale test pour was made. The test indicated that several important changes were needed; these improvements were incorporated in the 21 sets of forms that actually went to Kuwait.

The yard is fully integrated. It handles every process from manufacturing aggregate to storage and delivery of finished units.

Although planned specifically for the pier job, the installation is flexible enough to handle other precasting jobs. So it will probably stay in operation on a permanent basis after this job is over. It may well become one of Kuwait's major industries.

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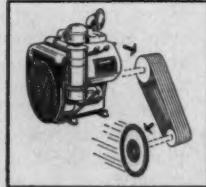
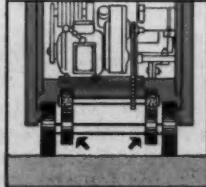
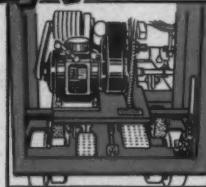
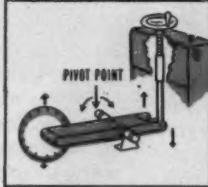
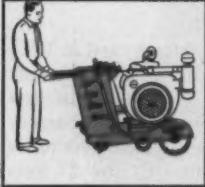
THE FASTEST CUTTING CONCRETE SAW BUILT!

The rugged Clipper 36 H.P. Model C-363, best ever built for production performance on highways, airfields — heavy trenching jobs. One of many Clipper saws for every job — every budget!

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BUILDS THEM...



Our engineering staff really outdid themselves with Dual Balance Design—which simply means that this Big Saw is so perfectly balanced that one man can easily handle it. The engine weight is over the blade, preventing blade "ride-out". It's easier to use than any other saw—another reason why 4 out of 5 Buy Clipper!

Only the most accurate blade feed was good enough for us, so we originated Ball Bearing Positive Screw Feed... which gives you positive control of the blade at all times... and enables you to keep abrasive blades at the proper cutting depth as they diminish in diameter. No other method... not even hydraulic... gives such complete blade protection.

We bring you the most powerful Heavy Duty Transmission ever used on a concrete saw. To it we've added abrasive coated drive wheels (ours only) which transmit smooth continuous power and propels this rugged saw through the toughest jobs at speeds up to 26 feet per minute. Another reason why it's the fastest saw ever built!

Solved! The problem of curving compound buildup on the drive wheels. We added two Separate Contact Wheels which never touch the pavement and operate right off the transmission drive wheels. Result? Continuous operation without downtime for wheel clean-up. A good example of our experienced know-how, which means more practical, efficient equipment for you.

Selection of component parts gets the same intelligent thought given the design of Clipper Saws. That's why we chose the dependable proven 36 H.P. Wisconsin Engine, then added 6 reinforced V-Belts to give 100% sure power delivery. That's why we can guarantee that no other saw can match Clipper!

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The plant currently is producing four sizes of piles—18-in. octagonal, 16-in. octagonal, 14-in. square, and 8x18-in. sheet piling. It also turns out five sizes of deck slab; the biggest of these is 48 ft long, 4 ft wide, and 2 ft thick.

The plant produces enough components every working day to complete one bent (24 lin ft) of the main wharf. In full production the plant turns out 1,600 ft of piling, 375 ft of sheet piles, and 2,000 sq ft of deck slab every day. Four separate casting beds with a total of 18 prestressing lines produce this total. Average day's pour is 200 cu yd. Labor force consists of 150 native workmen and four American foremen.

Each casting bed has three separate bays. The three bays allow each bed to operate on a three-day cycle. On any given day, while units are removed from one bay, the second bay is being prepared for a pour, and the third bay is under hoods for 24-hr steam curing.

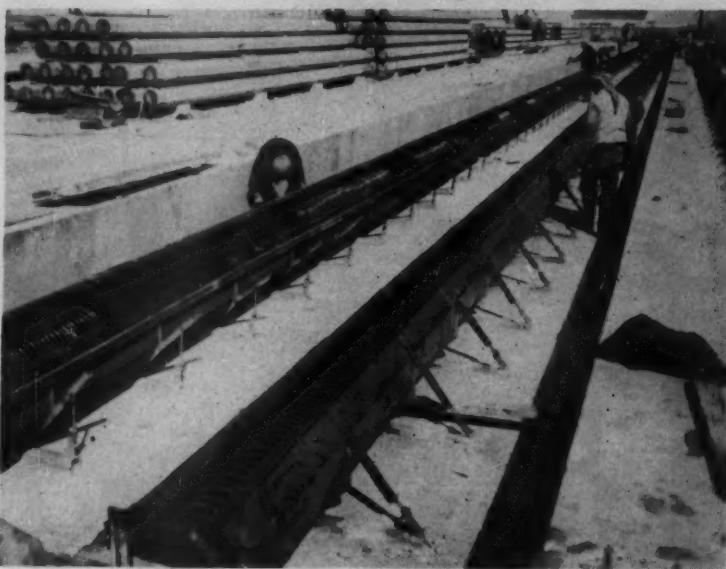
Crews in the yard work two shifts per day; concrete pouring generally is scheduled for the second shift. This reduces daytime traffic in the yard and permits better utilization of equipment. Also during most of the year the weather is very hot, and it is easier to handle concrete in the evening.

The normal work week is six days, Saturday through Thursday; Friday is the Moslem Sabbath. The contractors are getting in seven casts per week by working a little bit ahead each day so that on Thursday they can squeeze in two pours. A small crew comes in on Friday morning to change steam curing hoods. This gives each of the two bays poured over the weekend a 24-hr session of steam curing. The bay not under steam is cured by wet burlap.

Pile Casting Beds

Beds No. 1 and 3 are designed for pile production; the other two produce the deck slabs. The pile beds, built of 6-in. reinforced concrete, are 47 ft wide and 410 ft long. They are supported on 12-in. pipe piles. Pile foundations under all beds prevent settlement. The area is recently filled ground that is only a few feet above the water table.

Two Long Beds Produce



OCTAGONAL PILES—Forms on left are open; prestress wires are in place, but spiral wire is still bunched. Toggle-action side braces have closed the forms on right.

On top of each pile bed are four longitudinal beams, 2x2 ft in cross-section, that carry the stressing forces from abutments designed for 750 tons. The four beams divide the bed into three 13-ft-wide bays with two lines of pile forms in each bay.

The octagonal forms are fabricated of 12-gage metal and are hinged on 3 ft 4 in. centers. Adjustable side braces with toggle action lock them quickly into the closed position.

Each line of forms is 391 ft 8 in. long. The basic form panel length is 10 ft, but special lengths of 1 ft 8 in. and 3 ft 4 in. are available so that bulkheads can be inserted into the line where needed to make particular lengths of piles.

The bottom face of the pile is cast on a sliding plywood soffit that allows free movement of the pile during the transfer process.

Forms for making tapered tips are on hand for all pile sizes, but they are not being used. Early driving experience with both types showed that the square tip piles handled better and drove truer to line while achieving almost identical penetration.

Five lines on bed No. 3 are equipped to form 18-in. octagonal piles. These piles carry 110-ton vertical loads in the main wharf.

They are prestressed by 16 high-strength, stress-relieved, $\frac{3}{8}$ -in., 7-wire tendons, stretched at casting to 14,000-lb tension. Spiral reinforcement is provided by No. 5 gage cold-drawn wire.

One line on bed No. 3 has forms for making 16-in. octagonal piles. These piles, containing 20 wires, act as brace piles in the main wharf and bearing piles in small craft harbor structures. After all the 18-in. piles have been completed, liners will be placed in the forms to convert them to 16-in. pile forms.

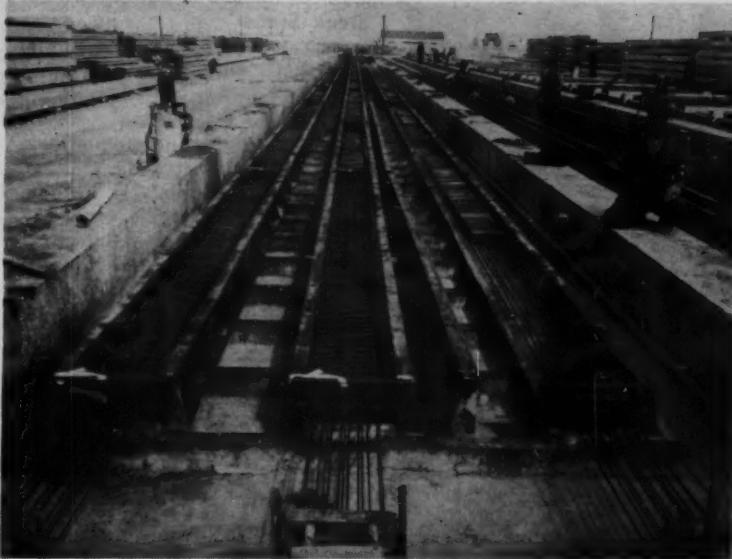
Four lines in bed No. 1 produce 14-in. square piles. These piles contain 16 wires and conventional spiral reinforcement. They are used as brace and fender piles in the wharf and for the transit shed footings.

Bed No. 1 also contains a bay with lines for casting 23-ft lengths of 8x8-in. sheet piling. Each line consists of 16 form sets so that 48 units can be made each cast.

Casting the Piles

Production on the 13 casting lines is a daily routine. The cycle starts when completed units are removed from the beds and the forms are cleaned. The first operation is to string prestress wires from rack-mounted reels through a dummy pattern block on the an-

Various Sizes of Piles



SHEET PILING—Side form is ready to be placed on right hand bay. The side forms are not connected to soffit form so that pile can move during stress transfer process.

chor abutment and clamp them into a traveling head called a "skate."

Pulled by a cable and winch, the skate travels toward the jacking abutment, unreeling the prestress wires as it goes. The cable, skate, and wires pass through spiral reinforcing bundled in each pile. To prevent transposed wires, the skate stops at each head form while the prestress wires are located properly in the slotted bulkhead.

The pulling skate comes off when it reaches the jacking abutment, and the prestress wires are fed individually through the last pile form into the jacking head. Strand vises secure them temporarily. At the anchor end the wires are cut from the reel with a torch and fed back through the anchor head where they, too, are locked with strand vises.

A special operation at the jacking end insures that all wires are the same length when tensioned and, therefore, will be equally stressed. A movable grip and lever pull each wire to a tension of 1,000 lb. A dial gage dynamometer measures the tension. When the gage reads 1,000, the strand vise is snugged up against the jacking head, fixing the wire length.

A Rogers hydraulic jack, with 8-in. cylinder and 48-in. travel,

tensions the wires. A 10-hp electric motor with remote control supplies the power. The jack is rated at 200 tons, which corresponds to 8,000 psi on the fluid.

Tension is checked by elongation of the wires. The jack gage pressure reading is calibrated to represent 14,000 lb tension in each wire. Total elongation is about 29 in.

After the tensioning is complete, the jacking-head anchor nuts are run up so the jack can be removed to other lines. Spiral reinforcing is spaced out and tied, and the forms are closed. If necessary, turnbuckle devices on the side braces of the forms adjust the alignment of the piles. The outside surfaces of the forms are sprayed with diesel oil to reduce concrete sticking and to prevent rust in the steam curing.

Prestress wire comes from Japanese mills and is tested by international testing agencies applying American standards. The wire arrives at the job site on 15,000-ft reels.

Spiral wire, also from Japan, comes in 300-lb coils. On the job a machine forms it into various sizes of spiral for the piles. The casting operation requires up to 6,500 turns of spiral per day, and the spiral machine operates two shifts to supply it.

Concreting

All concrete is made on the job. Jaeger transit-mix trucks haul it in 2 or 4-cu-yd loads from the plant to the beds. A 40-ton Manitowoc 2800 crane alternates two $\frac{3}{4}$ -yd concrete buckets to transfer concrete from trucks to bed. A small wood hopper pulled by hand along the top surfaces of the forms, minimizes spillage.

The 7.1-sack concrete contains only 4.6 gal of water per sack, but admixtures (either Plastiment or Pozzolith 8) give a workable mix with slumps between 3 and 4 in. Internal air and gasoline vibrators help consolidate the mix in the forms.

All prestressed concrete is steam cured to obtain strengths up to 5,500 psi in the first 24 hr. Hoods for the pile beds are fabricated of redwood timber with galvanized metal frames and 20-gage aluminum lining. Normal hood length is 20 ft.

Two Kewanee low pressure boilers feed steam through manifolds and hose connectors to each hood. Individually mounted thermostats in each hood maintain temperatures between 140 and 150 deg. Automatic recording thermometers are installed on two hoods in each line, and other visible gage thermometers are used to insure accurate performance of the regulators.

When the steam hoods are taken off, a crew immediately opens the side forms and removes the head and tip bulkheads. They use the jack to transfer prestress tension from the abutments to the units. During the transfer, the pile nearest the jack end slides 2 to 3 in. toward the anchor end; the other units move proportionately less.

This sliding action, especially on long beds with any amount of free wire exposed, is a factor requiring careful consideration in the design of pretension forms.

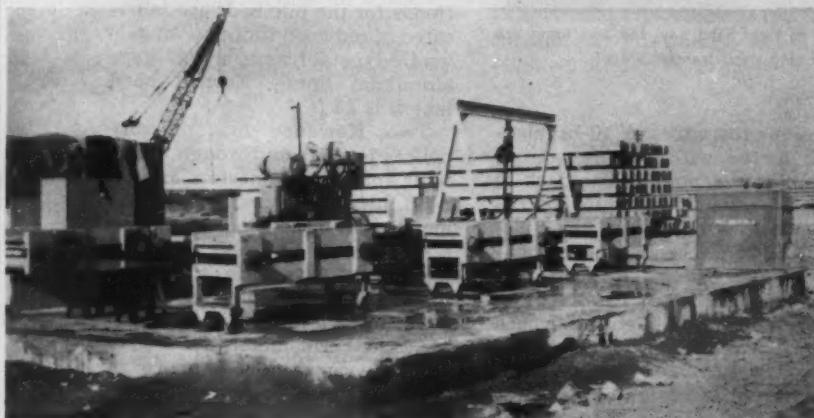
After the transfer, the crew trims the wires off at each unit. A truck crane, with strongback spreader and tongs, removes the piles to storage stacks. The tongs make it unnecessary to pass lines under the piles. Curing of the piles continues in storage under wet burlap for seven more days.

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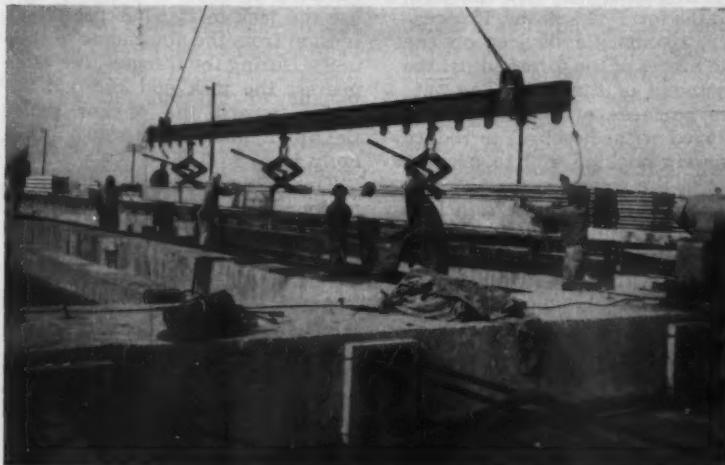
Simple Devices Aid Casting



LEVER—Movable grip and lever adjust tension in prestress wires to an even 1,000 lb. This insures that lengths will be the same, and jacks will stress each wire equally.



GANTRY—Simple gantry, mounting a chain hoist, moves jacks from one bay to another. Equipment is designed to complete casting and curing cycle in each bay every 24 hr.



TONGS—Strongback spreader and tongs with three-point pickup transfer pile from casting bed to curing and storage area. Tongs eliminate need to pass line under piles.

Deck Slabs

Beds No. 2 and No. 4 handle the deck slabs. Production operations for the slabs are pretty much the same as for the piles.

Bed No. 2 is a concrete platform 1½ ft thick, 30 ft wide, and 390 ft long. It has three sets of abutments, each formed by a group of four 18WF114 piles designed to resist a horizontal reaction of 400 tons. Each line can handle seven sets of 48-ft-long forms.

Bed No. 4, the smallest of the four, has only two lines on it. It is 20 ft wide and 175 ft long, with five sets of 24-ft-long forms in each line. The slabs carry up to 56 prestress wires that produce abutment reactions of nearly 400 tons.

The slabs contain two types of reinforcement in addition to the prestress wires. Mild steel reinforcement is pre-assembled in jigs, carried to the bed by forklift trucks, and placed as a unit. The slabs are also post-tensioned transversely when in place. Sleeves for the post-tensioning rods are formed with 24-gage galvanized sheets rolled with lock seams and held in position by circular medallions bolted to the forms.

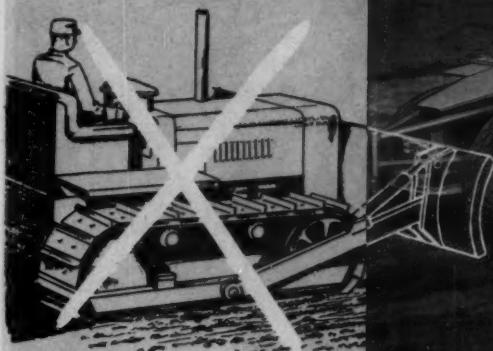
The forms consist of three elements. The sides, constructed of 8-gage metal, fold down on hinges. They sit on longitudinal channels, which, in turn, are bolted to the concrete. Diagonal braces for the sides are adjustable toggles.

The soffits are independent of the sides to allow for transfer movements. Soffits consists of 3/16-in. plate on angle iron frames that rest directly on the concrete and slide between the channels.

The end panels come in several pieces to fit between layers of prestress wires. They are bolted to the ends of the side forms. Side liners are available to change the 4-ft-wide slab to a 3-ft slab.

Prestress wires, varying in number from 42 to 56, are pulled through the forms from 24 reels on racks behind the anchor abutments. As with the piles, the 1,000-lb initial tension device equalizes the lengths of the wires. Then two 200-ton Rogers hydraulic jacks manifoldeled to a single

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The New JOHN DEERE 840 Diesel with HANCOCK "Piggyback" Scraper

NO HELP WANTED!

This unit heap-loads *itself* in less than a minute. The power-driven ladder-type elevator does it. Speeding work at the other end of the line, hydraulic ejection dumps the 7½-yard load in seconds.

No permit required! Under eight feet in width, the unit can be driven on most state highways without a special permit. Highly maneuverable on the job, too—makes working turns within a 22-foot radius.

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Perfect Circle piston rings are factory and replacement equipment on tractor that delivers full-time power to both tracks while turning or "equalizing" to steer with offset loads.

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Besides, the TD-24 gives you cycle-speeding, on-the-go Hi-Lo shifting. You adjust speed to the load without stopping, going forward or in reverse. You speed up the shuttle-dozing cycle, take full-time advantage of the TD-24's full capacity! The fingers of one hand can do it, too!

The TD-24's diesel engine is power protected with Perfect Circle chrome piston ring sets. Entire area of ring travel gets complete wear protection, *more than doubling* life of cylinders, rings, pistons. No tedious break-in is necessary, rings are pre-seated at the factory.

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PERFECT CIRCLE

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Don Mills, Ontario, Canada

MIDDLE EAST PORT . . . continued

10-hp pump, put the tension on the wires. A special gantry with a chain hoist moves the jacks from one line to another.

After the slabs are steam cured, a yard truck crane removes them from the beds with three lifting loops made of scrap $\frac{3}{8}$ -in. pre-stress wire cast into the slabs. A specially designed 30-ton lumber carrier moves the slabs to and from storage. A carrying frame that clamps to the slab with adjustable hooks allows a driver and one helper to handle the 20-ton slabs unassisted.

Concrete Production

The high quality of the concrete produced in the on-site plant is attracting attention throughout the Middle East. Cylinders sampled from routine pours often test over 10,000 psi at 90 days. Similar cylinders average 5,200 psi in 24 hr (after steam curing), 6,500 psi in 7 days, and 8,725 psi in 28 days.

The mix contains 7.1 sacks of Japanese "Onoda" cement per cu yd of concrete. The cement qualifies as Type II under ASTM C50. Coarse aggregate is crushed shingle, graded to a 1-in. maximum size. Some of the sand is manufactured, but most of it comes from nearby Persian Gulf beaches.

Roving Bedouins gather by hand all the shingle for the plant from surface deposits on the desert north of Kuwait. The natives put together small piles and haul them by donkey and saddle baskets into larger piles of about 1 cu yd each. Flat bed trucks with stake sides come onto the desert from Kuwait and haul away the shingle in 10 to 20 ton loads. It is hand shoveled from the trucks to storage piles in the yard.

The shingle that comes to the concrete plant is a rounded gravel-like mixture of various types of rock ranging in size from 1 to 6 in. Average specific gravity is 2.55. All rock comes from the surface; excavation below 6 in. meets pure sand. There are no quarry deposits of any importance in the area.

The shingle, plus raw sand for blending, goes through a 40-tph crushing plant installed in the yard. A truck crane with clamshell bucket feeds the material onto a Pioneer apron feeder. An Austin-Western jaw crusher breaks everything down to 2 in. after which the material passes

through a Tyler double-deck vibratory washer screen.

Oversize material is fed through a Nordberg cone crusher and recirculated to the screens. The sand passes to a Wemco scrubber.

Processed material is stockpiled in three rock sizes and one sand size over an 8-ft-dia recovery tunnel. Because the water table is within 5 ft of ground level, the recovery tunnel is only 4 ft below ground. A belt delivers aggregate to an elevating conveyor for

charging the bins of the 3-yd Noble batch plant.

There is no natural source of fresh water in Kuwait. Water for making concrete is distilled from sea water by a state-owned power and distillation plant. The water is unusually pure but it's expensive. To keep costs down, the contractor has set up settling basins behind the sand washer to recover thousands of gallons of water per day for re-use.

continued on next page

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Bailey Bridge Equipment Co.
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MIDDLE EAST PORT ... continued

Quality Control

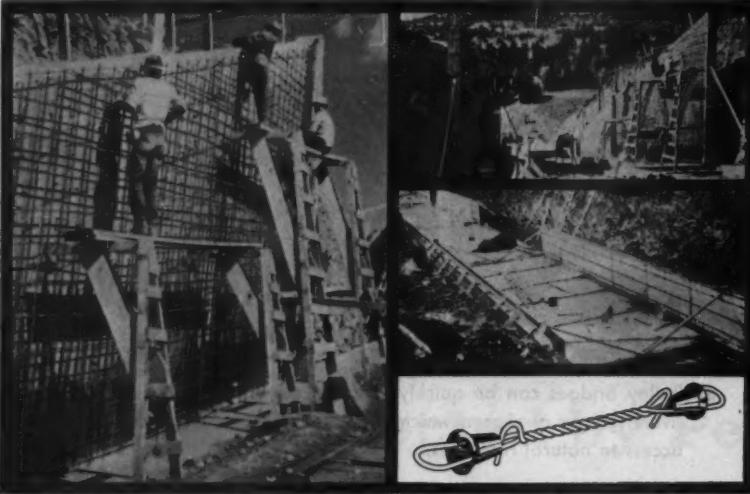
To make sure they are getting the kind of concrete they want, the Pomeroy-Hawaiian Dredging engineering staff has set up an extensive testing and quality control program.

Each prestressed unit gets a number. Data about tensioning, concrete, curing, and transfer is recorded for each unit and cross-checked with other data from the concrete tests and mixes.



AGGREGATE PLANT — Crushing and washing plant in background deliver three sizes of rock and one of sand to stockpiles. Conveyor feeds 3-yd Noble batch plant.

Dam Spillway Walls Battered And Tapered With Forms Set At An Angle



Recreational dam and spillway for Colorado State Game and Fish Department, Pagosa Springs, Colorado
Contractor: Hopkins Construction Company, Denver

PROBLEM: Specifications required that the main sidewalls of the spillway taper from 20'0" to 4'0" in height, within a distance of several hundred feet. As the height diminished, the thickness of these battered walls reduced at the bottom from 18" to 8". Wall thickness at the top was 8" throughout.

SOLUTION: Working with the contractor, Gates engineers adapted the standard Gates Commercial Forming System so that both panels and form ties were run parallel to the top of the wall and cut at an angle to the footing.

Special forms were designed for the inlet and stilling basins, while the main run of the spillway was formed with Gates Horizontal Rod System with no special adaptations necessary. The new PlastiCone* ties with a 1-inch break-back were used exclusively.

RESULTS: The forms were erected quickly and economically and the quality of the finished concrete was excellent.

Why not let us show you how Gates thin-panel forming can help you profitably solve your next forming problem.

*TRADEMARK



Gates & Sons, Inc.

80 So. Galapago Street

Denver 23, Colorado

Branches in Spokane, Rochester and Lethbridge



Page 166—CONSTRUCTION METHODS and Equipment—May 1959

Up to 24 test cylinders are taken in pairs from each day's pour. One sample in each pair goes under each end of the hoods during curing to subject them to an average of the curing conditions. Samples selected at random are tested prior to transfer and at 3, 7, 28, and 90 days as required.

A Soil-Test cylinder testing machine with a capacity of 400,000 lb handles the compression testing of the 6x12-in. concrete cylinders.

Pile Driving

Pomeroy - Hawaiian Dredging designed a pile driving rig especially for this job. They had it built in Hong Kong and towed to Kuwait along with other barges obtained at the same time. Feature of the driver is a universal lead arrangement that allows it to drive 1:2 batter piles either ahead or back under. With a moonbeam installed, it also can drive batter piles to either side.

The barge is 40 ft wide, 110 ft long, and 7 ft deep. The hammer is a single-acting McKiernan-Terry S-10 rated at 37,500 ft-lb per blow. It operates in 80-ft leads.

Working on the main wharf, the rig first drives the inner plumb piles for a number of bents. Then a crew puts in the staylathing on these bents while the driver works on uncompleted bents. The driver returns to drive the inboard batter piles, which are supported by the staylathing. It then drives the vertical piles.

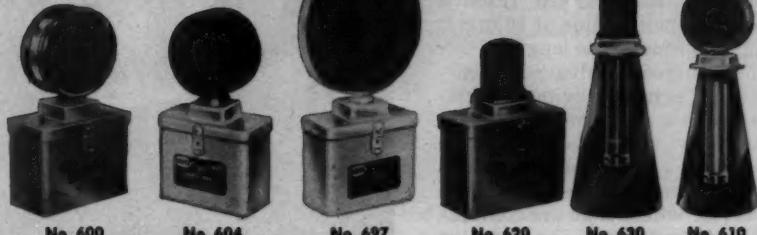
The last operation is to drive the outboard 5:12 batter piles. These are harder to handle because the pile overhangs the leads. An extension frame has to

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in relation to the
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**Use DIETZ
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to guide driver
around the hazard:

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Piles, Caps, and Deck

be temporarily attached to the bottom of the leads for this work. Because of the special handling needed for these piles, the driver tries to work on a group of at least 20 in one series.

Piles in the main wharf vary in length from 50 to 75 ft. The average is 65 ft. All must reach a minimum penetration of 10 ft into original ground. The length of pile is determined in advance by correlating actual driving experience with a series of jet probings previously done along the site.

A truck and pole dolly delivers the piles from the casting yard to a service wharf that the contractor built for his own use just west of the permanent structure. Barges move them to the driving site in groups of about 20, laid out to fit the driving sequence.

The driver lifts a pile from the barge with a two-point pickup. It can tip its leads over the barge to lift the pile clear, then tilt backwards. This speeds pile handling considerably.

Wharf Construction

After the piles are driven, stay-lath crews frame the bents with 6x12-in. timber. They cut off the piles to the proper elevation with jackhammers and torches. This work is handled from small floats and from the staylathing itself; this is the most practical system because of the daily 10-12-ft tide variation.

A cast-in-place pile cap spans each bent. The cap is 3x3 ft in cross-section and is poured from shore. The staylathing supports the formwork.

The inboard edge beam, running parallel to the shore, consists of a precast concrete H-section with a cast-in-place section on top of it. The precast beam is installed first to serve as a guide for driving a retaining wall of concrete sheet piles.

A Manitowoc 3900 crawler crane with swing leads and a skid-mounted boiler handles the sheet pile driving. The top 1 ft of the driven piles is cut off to expose the prestress wires. These wires are incorporated into the poured-in-place portion of the edge beam.

The outboard edge beam is built in a similar way. In addition, it is tied to the deck slabs by transverse post-tensioning.



BATTER PILES—Versatile floating rig drives inboard batter piles. Leads are mounted so they can pick up piles from barge, tilt forward, backward, or sideways to drive them.



SHEET PILES—Land-mounted crawler crane drives prestressed concrete sheet piling. Precast concrete edge beam connects pier bents, serves as guide for driving piles.

The prestressed deck slabs go on after the edge beams are complete. Dowel bars are inserted into sleeved holes in both deck and cap and grouted in. More grout, placed in the joints between slabs, forms a longitudinal shear key.

While the joints are being grouted, inflatable rubber tubes keep open the transverse post-tensioning holes through the slabs. After the grout is in, the tubes are deflated and removed.

The transverse prestressing system, consisting of 1½-in. high

tensile rods at 6-ft centers, ties the entire deck system together. The rods are jacketed to 145,000-psi tension, anchored at the outboard beam, and grouted.

Dredging

For the dredging part of the job, Pomeroy - Hawaiian Dredging moved their 27-in. hydraulic dredge, "W. F. Dillingham," from Honolulu to Kuwait. The Dillingham is a steel-hulled craft, 163x39x11 ft, with a registered gross tonnage of 645. The 11,500-mi tow

Complete Assembly Phase



PILE CAPS—Cast-in-place, 2x2-ft concrete caps tie together vertical piles. Holes in caps match dowel holes in deck slabs.

by the ocean-going tug, "Moi," required more than two months.

All machinery aboard the dredge is driven by ac electric motors. The primary power plant consists of four 1,600-hp General Motors two-cycle diesel engines, driving 1,000-kva, 2,300-v generators.

The main pump has a 34-in. suction line and a 27-in. discharge line. It is driven by a 3,000-hp induction motor. The pump is located in a watertight compartment in the bow of the dredge. A

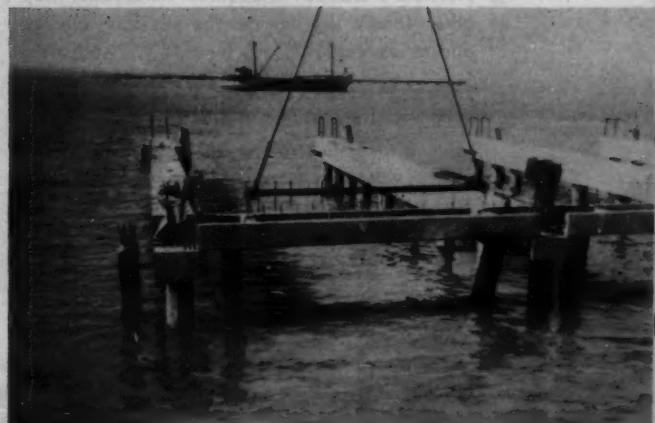
special heavy duty wire-reinforced suction hose connects it to the digging ladder. The cutter is turned by a 1,000-hp induction motor through a 13-in. steel shaft.

With a dual spud frame at the rear, the dredge is swung by a 150-hp winch that develops a 100-ton line pull on bow quarter anchors. All auxiliary pumps and compressors are duplicated for dependability. Dead ship power is provided by a 250-kva and two 75-kva Caterpillar diesel generators.

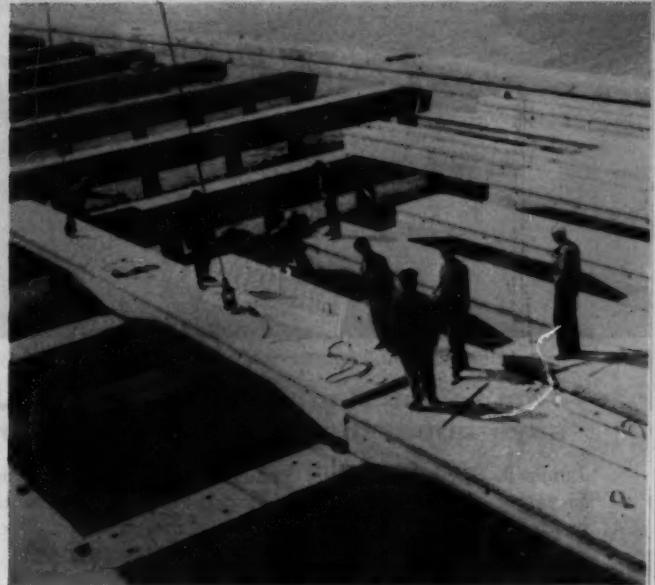
The Dillingham can cut a channel 250 ft wide to a depth of 40 ft, pumping material through as much as 5,000 ft of 27-in. pipe against a static lift of 20 ft. Production ranges from 8,000 to 30,000 cu yd per day, depending on the material being handled.

The dredge works three shifts a day, seven days a week. A day's shutdown every two weeks allows for overhaul and maintenance.

A Manitowoc 4500 crane with a 140-ft boom and a 5-yd dragline bucket handles excavation and



EDGE BEAM—Crane places precast, H-shaped inboard edge beam between two pile bents. Top half of beam is cast over this section.



DECK SLABS—Crane handles precast deck slab by lifting hooks cast into the slab. Slabs are thickened at ends and in middle.

"The Cedarapids Bituminous Paver MAKES EVERY OTHER PAVER OBSOLETE"*

- **Paves Faster**—"About four times faster than other pavers. We can get the job done quicker and at less cost."
- **Lays Perfect Mat**—"We save time and money because we don't have to go over rough spots. It takes less rolling because of the Cedarapids vibrating screed. On our Philadelphia International Airport job, we got 98% compaction."
- **Easier to Operate**—"Take a look at that control console and you'll see why I say it's so easy to operate. Why, my 12-year old daughter could operate that machine . . . in fact, she has!"
- **Less Maintenance**—"The Cedarapids Paver has $\frac{1}{3}$ less wearing parts than others. There's less to go wrong, so we cut down on maintenance."



*That's what Paul Skelly of James J. Skelly, Inc. says about their Cedarapids Bituminous Paver

James J. Skelly, of Media, Pennsylvania, has been a paving contractor for 55 years. He and his son Paul bought the first automatic bituminous paver in the East, and have used various makes since. They know bituminous paving and what a paver should do!

After operating their first Cedarapids Bituminous Paver, bought in early 1958, they used another to help handle the job of laying 27,000 tons in 15 working days at Philadelphia International Airport. As the mixing plant couldn't keep up, Skelly ended up getting material from three plants and completed the job way ahead of schedule.

Do you want the detailed story about the Paver that has revolutionized bituminous paving operations . . . and profits? Write for complete information.

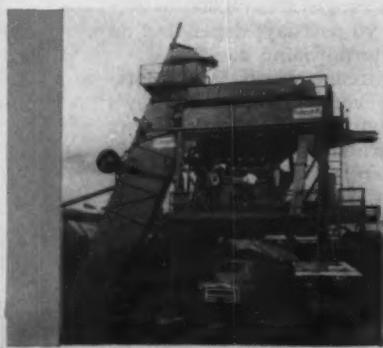
IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa, U.S.A.

"Service is simplified 100% over any other make paver"

That's the word from Skelly's master mechanic, Wayne Stauffer. He says, "The Cedarapids is so easy to maintain . . . to get inside, all I have to do is lift the deck plates and everything is right where I can get at it. The machine has fewer drive chains, another thing I like. It's a snap to grease because the fittings are easy to get at. This is always a headache with other machines. The automatic controls make operation so easy that I could train a man in one day and know he'll do a good job."

Here's the rest of your Cedarapids Bituminous Paving "Package"

There's a size and type of bituminous mixing plant in the Cedarapids line to meet your needs. The big G60 portable batch-type plant (left) or the H60 stack-up plant deliver up to 240 tons per hour to keep up with the high capacity of the Cedarapids Bituminous Paver. Sizes range down to the Model H15 (right) for producing specification mix in the volume you need.



Dredge Excavates Harbor



'ROUND THE CLOCK—Dredge works 24 hr per day, 7 days per week to remove 3,600,000 cu yd of material for entrance channel. Dredge sailed from Honolulu for this job.

backfill adjacent to the wharf. This rig, one of the largest crawlers in the Middle East, can reach any area of the marginal wharves. It has eliminated the need for floating cranes on any part of the wharves themselves.

Rock Excavation

Some of the ground being excavated contains layers of cemented sand, known locally as "gatch." Gatch is something like low grade concrete. Core-drilled samples broken in a testing machine have registered as high as 2,200-psi compressive strength.

The Dillingham can cut its way through small areas of gatch, but its production drops, and the cutter head teeth have to be changed more often. A special drill barge mounting four Joy TM-500 rock drills on 58-foot movable towers, drills, loads, and shoots the larger deposits of this underwater rock to break it up so that the dredge can handle it.

The biggest patch of gatch occupies 100,000 sq yd in the new channel entrance. The barge will drill about 90,000 lin ft of 4½-in. holes averaging 10 ft in depth to remove this bar.

Getting Started

Pomeroy - Hawaiian Dredging got the job off to an extra fast start by chartering the 10,000-ton Norwegian steamer, "Beljeanne," and shipping to Kuwait in one batch all the equipment necessary

to start the job. Since then, regular shipments of equipment and supplies have arrived at the job under normal shipping procedures. But the dramatic chartering of the Beljeanne saved a great deal of time during the setting-up phase of the work.

The details of coordinating this shipping operation illustrate well the type of support needed for a major overseas project.

When the charter agreement was reached, the Beljeanne was in the western Pacific. It sailed at once to Honolulu, home port of

the Dillingham, to pick up dredge pipe, pontoons, cutterheads, tractors, cranes, welders, tug boats, spare parts, and other items.

This cargo was stowed aboard under a plan designed to handle later additions, but maintaining proper balance of the ship at every stage.

Ship Schedule

The Beljeanne then sailed to Richmond, Calif., where more equipment for the job had been concentrated. This equipment included a Manitowoc 4500 crane, 4 truck cranes, the complete aggregate plant, the batch plant, tractors, shovels, and prestressing equipment—a total of more than 2,000 tons.

Meanwhile 350 tons of equipment from a job just finishing on Guam were shipped by regular steamship to Yokohama, Japan, where the Beljeanne stopped to pick it up.

From Yokohama the Beljeanne went to Hong Kong to pick up a load of steel barges, floats, pontoons, and tugs, built for the job by a major shipbuilding firm there.

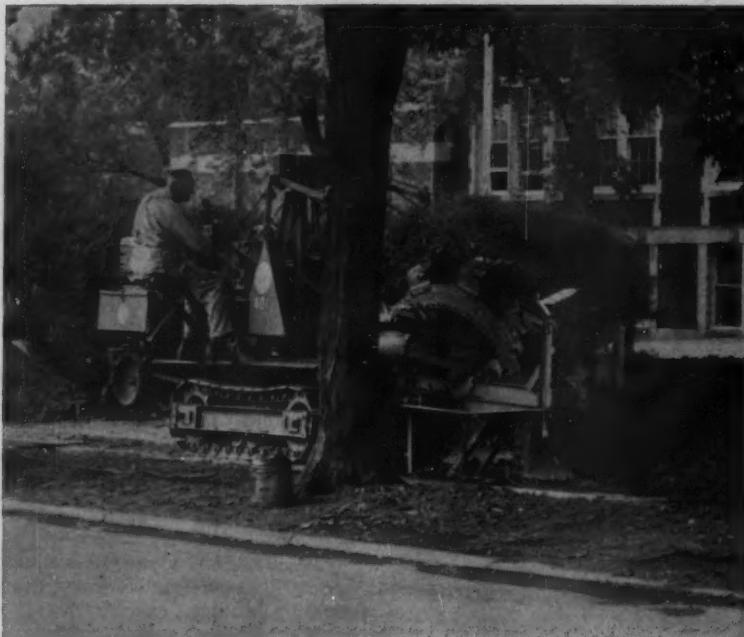
These items filled the last remaining space aboard the ship, and the Beljeanne sailed for Kuwait with all holds full and every square inch of deck space covered with construction equipment.

continued on next page

Complete Plant—One Shipload

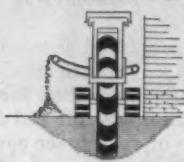


CROWDED DECK—Construction equipment fills every square foot of deck space on ship. Contractor chartered ship to speed equipment movement, get job started faster.

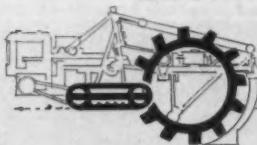


Nothing digs trench in the city like a Cleveland "Baby Digger"

PUTS TRENCH WITHIN
20 INCHES
OF A PARALLEL WALL



MORE THAN 30 USABLE
COMBINATIONS OF
CRAWLER AND
DIGGING WHEEL SPEEDS



GIVES YOU THE
RIGHT COMBINATION
of POWER and SPEED
FOR EVERY SOIL
AND JOB CONDITION

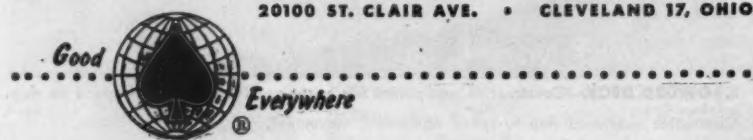
If your jobs involve city and suburban trenching, a trim maneuverable Cleveland 92 is the trencher for you. This "Baby Digger" has the practical features and advantages that give you greater, more economical production in crowded areas ...*more trench...in more places...at less cost.*

- Only 4' 6" wide over its crawlers.
- Shiftable, reversible conveyor.
- Digs easily past trees, poles, fences, etc.
- Digs 10" to 20" wide...down to full 5' deep.
- Full crawler mounting...completely maneuverable...perfect balance and stability...easy on lawns, sidewalks, etc.
- Finest crawler on any trencher...long-lived...non-packing...easy-rolling...friction-free...sealed bearings...200-hour lubrication.
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- Used on thousands of miles of trenching for gas...water...sewer...telephone...electric power...building footings...airport, highway construction.

fast • accurate • clean • dependable
nothing digs trench like a Cleveland

The CLEVELAND TRENCHER Co.

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MIDDLE EAST PORT . . .

continued

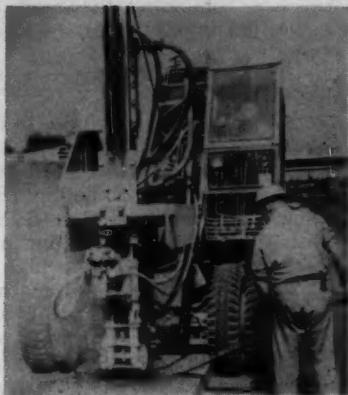
At Kuwait, she encountered the normal port congestion — the avoidance of which was the real reason for her voyage. The ship's own booms unloaded the tugs and barges into the water. These in turn formed a lighter service that ferried the rest of the deck cargo ashore.

Men on the Job

For Pomeroy-Hawaiian Dredging, C. M. Sheldon is project manager, G. R. Chaffin is general superintendent, Gordon Halvorson is assistant general superintendent, Jack Bommhardt is chief engineer, W. R. Hirvela is pre-stressed concrete engineer, and Sam Laughlin is comptroller.

For the government of Kuwait, Fouad Abdel-Baki is inspector general, W. Deeb is project engineer, and Ian Wilson and Tom Ponsonby are resident inspectors in the casting yard.

JOB TALK EXTRA . . .

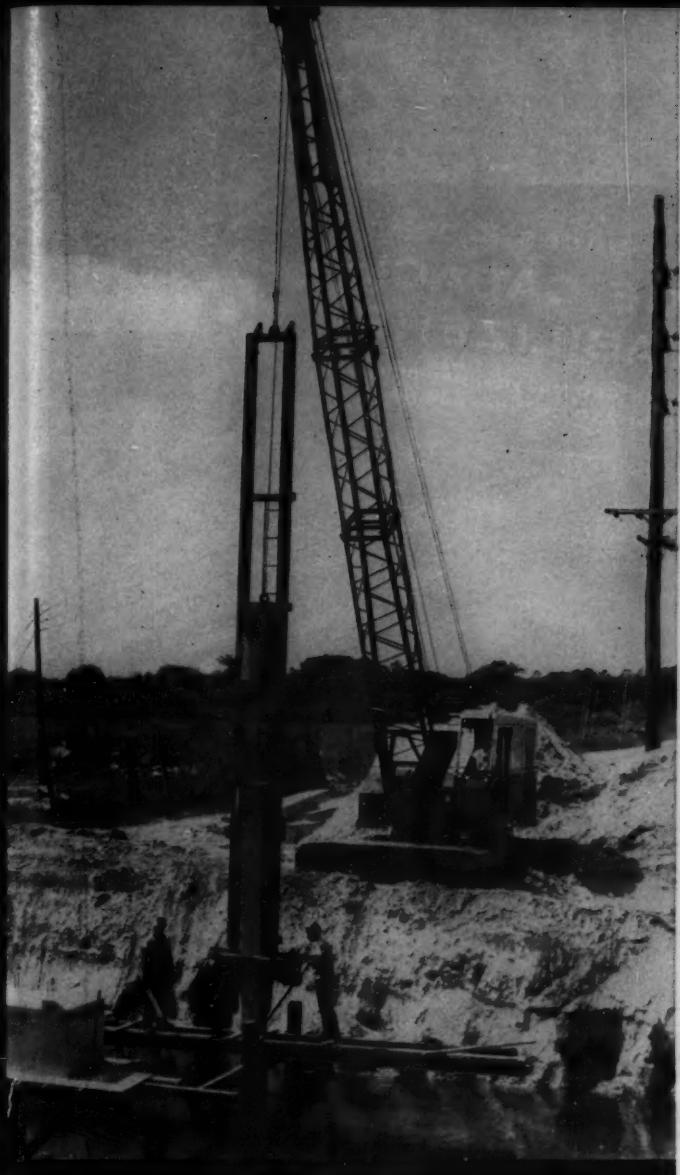


Drill Digs Post Holes

With a Joy TM-500 drill mounted on the chassis of an old shovel, Hannan Brothers Contractors, Portland, Ore., are digging out holes for guard rail posts at a rate as high as one every two minutes.

A saddle from a TDL Trac-Drill mounts the drill on the shovel chassis. They shortened the feed to 8½ ft and cut three 6-ft lengths of drill steel from a 20-ft-long section of 2-in. steel.

The posts are set in the center of a concrete divider between lanes of traffic on busy Highway 30 in Portland. Depth of the holes is 4½ ft. Hannan completed more than 2,300 holes in only 145 working hours.



STAKING OUT A FLORIDA CLAIM

Many Marions have played important roles in Florida's rapid development.

Typical is this Marion 35-M which works on seawall, foundation and bridge projects. Here it carried a drag bucket to remove old piling and debris from the site of an old bridge demolished by explosives.

Then it went into crane and pile service to set and drive concrete piling for the new structure.

Marions are busy staking out claims to fame in many states these days for sound reasons your Marion Distributor will be happy to explain.



MARION POWER SHOVEL CO. MARION, OHIO

A Division of Universal Marion Corporation

Power shovels, hoes, draglines, clamshells, cranes -- crawler, rubber and walker mounted -- $\frac{3}{4}$ to 100 cubic yards



**for better control of proportions in base materials
... better final mixing . . . plus extreme portability**

Highway officials are becoming more and more exacting in their requirements for accurate proportioning and control of base materials, as well as in final mixing. They are specifying that the stabilized materials be premixed with more care and greater control.

To provide this better control in large capacity operations, also to provide maximum portability, H&B engineers have developed two new mobile Stabilization plants with capacities up to 400 cu. yds. per hour.

Both of these Stabilizers are unit type plants, with individual units operated by electric drives. The Feeder, Mixer and Aggregate Conveyor are wheel mounted to operate in running position without jacking up or cribbing. The cement conveyor, also electrically driven, has a variable speed drive for accurate control of cement feed volume according to the mixing formula.

An electric generator set, driven from the diesel engine, is available with either plant as optional equipment.

For complete information see your H&B distributor or write direct to:

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Allis-Chalmers utility tractors give you the low-cost pulling power you're looking for on this necessary job!

The beauty of an Allis-Chalmers tractor is that when it isn't pulling the roller it can be working with a loader handling finish work...placing rock around culverts...or working with a hoe, cutting out trenches or catch basins.

When you're working on streets or highways, you can't afford to have *idle equipment* sitting around waiting to do one job. Put these tractors to work. They'll cut costs, and turn in profits.

And remember, "D" series tractors are designed with years of Allis-Chalmers big earth-moving equipment experience. You'll see the difference the minute you see one in action.

On this operation, the big difference is POWER DIRECTOR, which lets you shift from low to high range on-the-go!

D-14 43-hp, 4,200-lb weight
D-17 63-hp, 5,300-lb weight

**IT DOESN'T COST TO FIND OUT! Mail coupon below
and we'll arrange a demonstration on your job!**

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**ALLIS-CHALMERS MFG. CO.
Utility Tractors and Equipment
Milwaukee 1, Wisconsin**

Gentlemen:

Show me more about the new design Allis-Chalmers utility tractors and equipment.

I'd like Literature A Salesman's Call
 A Job Demonstration

Name _____

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Address _____

City _____ State _____

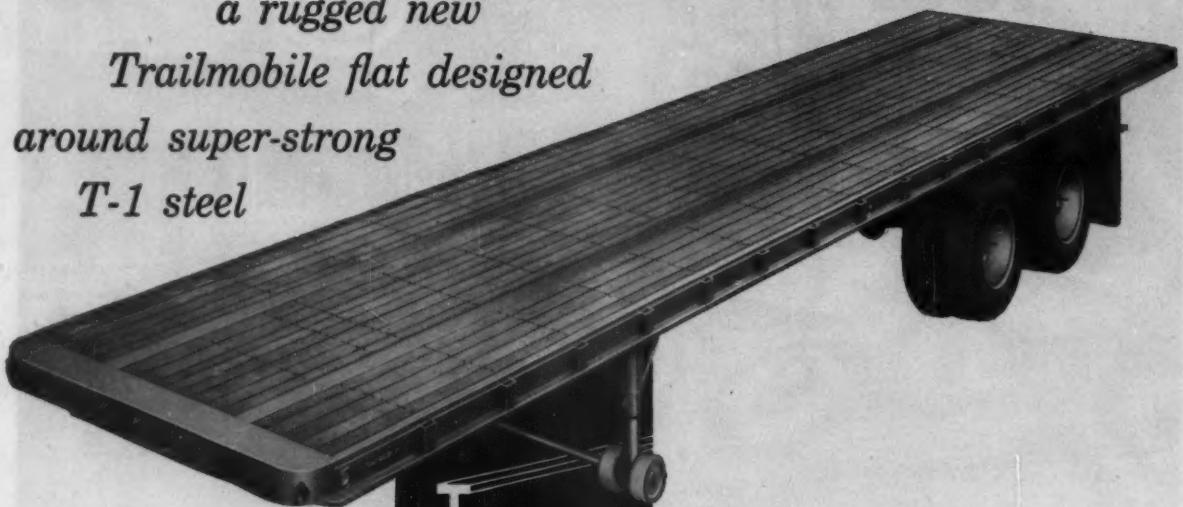


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announcing the

J·RAIL

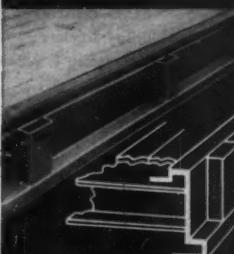
*a rugged new
Trailmobile flat designed
around super-strong
T-1 steel*



Husky "J" shaped main rails are feature of new design that offers exceptional strength while eliminating unnecessary weight.



Underside view shows how I-beam cross members go through husky "J" shaped main rails. Note that cross members are welded in place at intersection points.



Stake pockets accommodate light-weight aluminum racks for easy conversion to open top. Inset sketch shows unique one piece design of rub rail that adds extra strength.

***lighter! stronger!
lower in price!***

The use of brawny T-1 steel (105,000 lbs. tensile strength) in the main rails of this new Trailmobile achieves a new standard of performance for flat trailers. Weight has been cut by literally hundreds of pounds! In fact, this powerful all steel design all but matches the lightness of aluminum units.

Approximate weight is only 8500 pounds—so with a 72,000 pound gross vehicle weight the J-RAIL gives you up to 50,000 pounds of payload capacity! And you get all this profit capacity in a trailer that costs less than any comparable steel or aluminum flat available today.

Further, the J-RAIL, available in lengths up to 40 feet, will take tandem-tandem operation . . . can be equipped with any kind of suspension (including a standard tandem, 9 foot spread, Trail-Level air-tandem or sliding tandem) . . . and it can be easily converted to an open top with the addition of light aluminum racks.

Before you buy any flat, look into the singular advantages offered by the new Trailmobile J-RAIL. You simply can't get better performance—at any price.

TR-782

TRAILEMOBILE INC.

Cincinnati 9, Ohio • Berkeley 10, Calif.
Springfield, Mo. • Longview, Texas

A New York concrete subcontractor pours 10,000-sq-ft concrete slabs in three-day cycles after design engineers substitute wire reinforcing for bars.



Wire Mesh Speeds Slab Pours

HOW'S THIS for production?

Only three days to form, place reinforcing, and concrete each 10,000-sq-ft reinforced concrete slab for a 12-story building. Sounds unlikely—but that's the work rate of Dic Concrete Corp., Elmont, N.Y., on an apartment building going up in the heart of New York City.

Two factors make the fast work schedule possible. They are: (1) substitution (for the first time in New York City) of welded wire fabric for conventional bar reinforcement; and (2) a smart, efficient work schedule that literally has all trades working simultaneously.

Simple Design

Floors are relatively simple in design. Reinforced concrete columns support a 60x140-ft slab 5½ in. thick. The only beam work is a spandrel that runs around the perimeter. Reinforcing designed for the slab consists of two layers of welded wire fabric mats of several different gages depending on location.

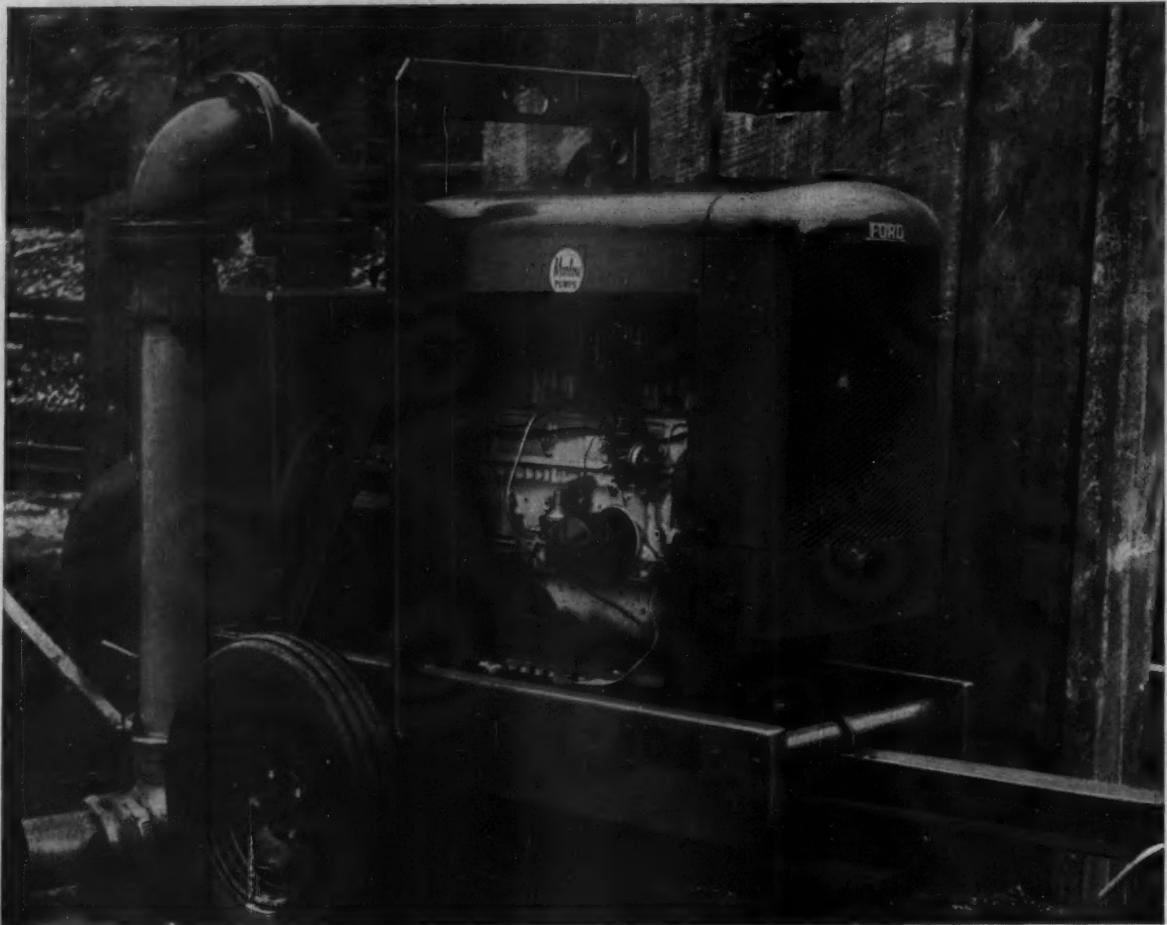
The three-day cycle for erecting a slab begins, on the first day, with the setting up of column forms and falsework for deck forms. On the same day, placing of plywood-panel decking gets under way. After a small area of decking is placed, the floor suddenly comes alive with activity. Many things seem to happen at once.

Steel workers drop into place the reinforcing cages for columns and spandrels. Others place ¾-in. steel low chairs to support fabric

continued on page 180



PLACING MESH—Workmen position ¾-in. chairs that will support mesh over numbered plywood panels while others follow up placing a bottom layer of welded wire fabric.



This 6E4, Ford engine-driven Marlow Contractors Pump, sold by Foundation Equipment Co., was used 8 hours a day to keep the hole dry. The unit has a capacity of 90,000 G.P.H.

Marlow Pumps Help Keep \$25,000,000 Yonkers Sewer Project On Schedule!

The City of Yonkers, N. Y., has a new \$25,000,000 sewer system being built by several contractors. The work includes a new pipeline, plus additional treatment capacity. The project, made necessary by the pressure of a continuous population increase, will relieve the present system and strained sewage treatment facilities.

A local firm is one of the contractors on the project. Their part of the program calls for the installation of approximately 2,600 feet of 54" reinforced concrete pipe at an estimated cost of \$700,000. To keep the excavation dry at all times, the contractor operated a 6E4 Marlow pump 8 hours a day. With this efficient unit running at a capacity of 90,000 gallons per hour, not one day of work was lost because of seepage water. 8-276

The firm has used Marlow Pumps for over 10 years. During that time, they depended on Marrows for every pumping job no matter how tough it might be. The firm is well satisfied with the efficient, trouble-free operation of Marlow Pumps.

Marlow builds the most complete line of A.G.C. rated contractor pumps, Mud Hogs and pumps for every construction application. Write today for the name of your Marlow dealer and Contractor Pump Bulletin C-09.



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PUMPS®**

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20,000 psi

New SJI 20,000 psi design standards offer added useful strength *in steel joist construction*

Architects and engineers now are offered SJI Standards for open web steel joists based upon 20,000 psi working stress. Open web steel joists meeting the Institute's recommended specifications are thus in balance with all other steel used in structures. Greater economy and a more efficient use of steel result.

Another recent development by the SJI has been an increase in the number of recommended Series "S" joists from 17 to 25, to provide greater flexibility and a more exact

application of open web steel joists for given structural loads.

The Institute has also published new combined specifications and load tables covering both "L" and "S" Series joists.

These new developments by the Steel Joist Institute give added assurance that you can specify with confidence when using steel joists produced in accordance with the standards and specifications of the Steel Joist Institute.

Send coupon for free copy of combined specifications and load tables.

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Standard Specifications and Load Tables.

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Company _____

Address _____

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WIRE MESH SPEEDS SLAB . . .

continued from page 177

mats clear of deck forms. Wire mats, raised from street level to the floor by crane, are set over the chairs.

And, while one large crew of steel workers ties a layer of mats to chairs, a second, smaller crew sets high chairs to support the upper layers of wire reinforcing. During this time, electrical and plumbing trades set their boxes and conduits behind a third, small crew of steel workers who cut out openings in the wire fabric. Insert locations are pre-marked on panels so steel workers can quickly cut out sections of wire before fixtures are placed. These panels are moved up after each pour and placed in identical positions on the floor above.

Finish Steel

First thing the following morning, steel workers finish setting high chairs. The placing of the second layer of wire also gets under way while electricians and plumbers finish their work. Meanwhile, laborers follow up, placing runways and a dual-hopper concrete bin at the street edge of the floor. The pour begins the following morning.

A 3,500-psi Lelite concrete containing Darex, air-entraining agent is delivered to the site in transit-mix trucks and raised to floor level by crane and bucket. The concrete bucket dumps the material into the roof-edge hopper where it is discharged into Whiteman motor buggies that carry the concrete over the runways to the placing area where it is dumped, vibrated, screeded, and finished. About 240 yd of concrete goes into a slab pour. Pouring time runs a little over five hours.

After 72 hr, forms are stripped, re-oiled, and lifted by crane to the next floor. Slab bottoms are ground down with a Giraffe concrete grinder that trims form-seam fins and ridges to a 3/16-in. tolerance to prepare the ceiling for plastering and painting.

Men on the Job

Job superintendent for Dic is Nat Pierdiluca. Anthony Bertone is Dic's chief engineer. James Raimonde is general superintendent for Southmore Realty Corp., builder.



PLACING CONCRETE—Whiteman motor buggy dumps a load of concrete over made-ready section of deck. Buggy takes concrete from dual-hopper bin set up on street edge.



FINISHING UP—Last of a 240-yd pour of concrete goes into place on far corner of floor. Workmen pick up and move runways back as concreting for slab nears completion.



NEW CYCLE—Column forms, jacks, and stringers for deck forms of the next slab are set up the following morning. Reinforcing and electrical conduits will go in the next day.



1 1/2 yd. TROJAN

...Packed with Operating "Extras"

There's no mistaking this new Trojan 124 — a standout performer in any task force, on any job . . . This is the 1½ cu. yd. tractor shovel that you have been asking for . . . The new job-rated Trojan proudly presents an imposing combination of extra operating benefits that can only spell P-R-O-F-I-T to the user.

At no extra cost Trojan offers the safety and greater visibility made possible by Trojan's *patented safety curve arms*, a favorite with tractor shovel operators . . . the maximum stability provided by wide-tread tires . . . 10,000 lbs. rated lifting capacity, highest for any machine of this size . . . greater carrying capacity . . . 40° bucket tip back at carry position . . . full power shift transmission . . . a variety of bucket sizes from 1½ to 2 cubic yards . . . choice of gas or diesel power . . . plus the widely preferred Trojan features that insure low-cost, efficient production on so many jobs today!

Give your Trojan distributor a few minutes of your time. That's all he needs to prove to you that the new Trojan Model 124 can be your most valuable piece of working equipment . . . Ask for a demonstration — see it in action!



Take full advantage of the variety of applications your Trojan 124 can offer, and all other Trojan models as well, with such quick-change attachments as pallet forks, backhoe, snow plow, dozer blade, crane hook and special buckets.

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New BROS Roller... See how you can benefit by these 15 improved features



NEW EASE AND SPEED FOR BASE AND SURFACE COMPACTION

Big news about the new 3 to 10 ton BROS SP-54B.

A new "Velvet Drive" hydraulic reversing transmission provides sure, effortless control for back-and-forth rolling. Automotive type hydraulic power steering and short turning radius makes turn-arounds easy—even on city streets.

Especially important, horsepower is correctly matched to job needs, keeping your fuel costs and engine maintenance to the minimum. Yet it provides the extra draw bar pull to tow a second roller on base and grade work.

A 40 gal. gas tank keeps the SP-54B working a full shift without refueling stops. High travel speeds to 20 MPH cuts time traveling between rolling jobs.

Special sculptured roller chain sprockets provide

full oscillation of drive wheel pairs. This eliminates complicated mechanisms which require frequent maintenance or service. New, 60% over-size high capacity Timken wheel bearings are mounted on husky, high-strength axles. A special triple groove steel labyrinth type seal and triple lip synthetic grease seal keep dirt and grit out.

Parking brake on drive shaft and individual service brakes on all 4 drive wheels add 95% more brake capacity . . . adding a greater margin of operator safety and control.

OTHER SP-54B FEATURES INCLUDE:

Torque converter drive. . . Direct connection of steering ram to front bolster. . . Lower center of gravity and lower silhouette. . . Easy access to drive train. . . New plastic scrapers to prevent tire pick-up. . . 100% coverage by $\frac{1}{2}$ in. tire overlap.

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Write today for a new 8-page catalog which fully describes the SP-54B. It's free of cost or obligation!



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TAMPERS



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PREPARATOR



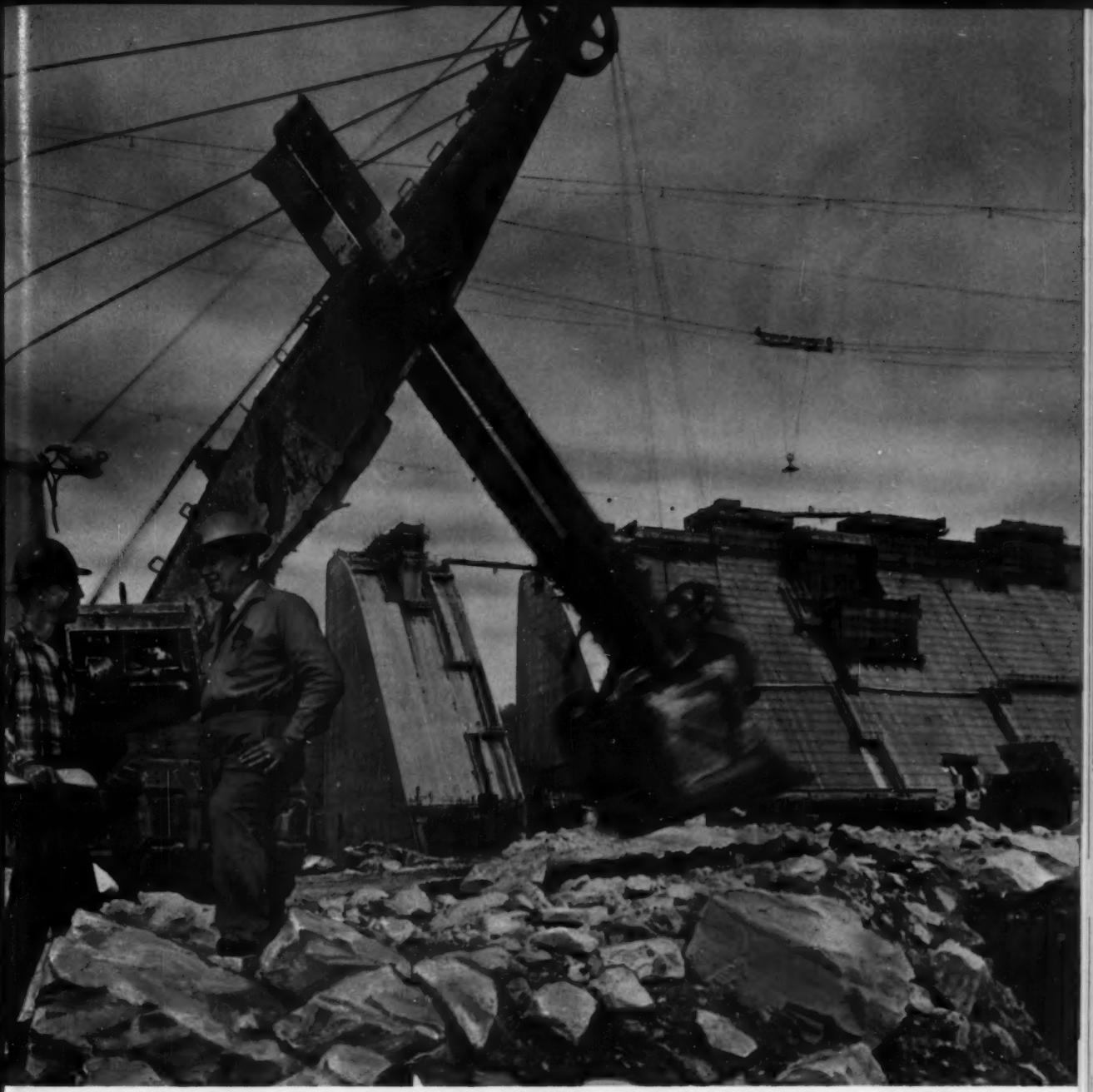
30-TON SELF-PROPELLED ROLLER



VIBRA-FACTOR



9 AND 13-TON
ROLLERS



\$30,000,000 Sutton Dam takes shape near Sutton, W.Va., where Gulf fuels and lubricants help keep this Army Engineers' flood control project on schedule. Joint contractors, under supervision of Mr. J. H. Hay are: Arundel of Baltimore, Md.; L. E. Dixon of San Gabriel, Calif.; and Hunkin-Conkey of Cleveland, Ohio. Over 380,000 cubic yards of earth and rock will have been moved, and more than 610,000 yards of concrete placed when the dam is completed late in 1959. Pictured above are J. H. Hay, (right), General Superintendent of the Sutton Dam project, and John Hindsley, Gulf Sales Engineer, at the dam site. On-the-job help is part of the service you get from Gulf.

GULF MAKES THINGS RUN BETTER!
It's proved on every type of job >>>



Gulf products and service help you trim costs and beat deadlines...

Since every contractor is in business to make money, it will pay you to see how Gulf makes things run better cost-wise and operation-wise . . . through clean-burning fuels, clean-working lubricants, prompt deliveries and top-calibre service.

You'll save money on maintenance costs when you switch to Gulf fuels and lubricants—because they help you keep your equipment working longer between overhauls. They prevent harmful engine deposits, excessive wear, and clogged fuel injectors.

You'll save time when you go Gulf—not only by reducing mechanical delays and unnecessary downtime—but because you'll be sure of prompt delivery from a dependable source of supply. 1500 strategically located warehouses in 32 states provide an unfailing supply of the Gulf fuels and lubricants you need.

You'll be sure of on-the-job help from your Gulf Sales Engineer, who is backed up by 1300 Gulf scientists and engineers at Gulf Research Center. Your operation will run more smoothly, more profitably.

GULF MAKES THINGS RUN BETTER!



"Penn-Can Highway" contractor slashes downtime on 300 pieces of heavy equipment, using Gulf fuels and lubricants. S. J. Groves & Sons Company of Syracuse, New York, built all grade separations and approaches and did all landscaping for 16 miles of highway and 15 miles of access roads on "Penn-Can Highway" in upper New York State. Photo shows work on the Oswego Boulevard section in Syracuse, where 250 buildings were removed in order to form a connecting link to the highway.

Gulf services an unusual "floating service station" rigged up by Heavy Constructors of Miami and Fort Lauderdale, contractors on the new 36th Street Causeway in Miami—a \$3,500,000 job. This barge stores and transports 5100 gallons of Gulf Dieselect fuel, 1650 gallons of Good Gulf gasoline, 8000 gallons of fresh water and 400 barrels of cement . . . for the pouring of 20,000 cubic feet of concrete instream to form piers for the causeway. Key to the success of the operation: delivery of materials to shore site.





Conditions wet. Schedule met. Plowing through the muddy roadbed of U.S. Route 301, Dickerson, Inc., of Monroe, N.C., turned up a lot of evidence that Gulf makes things run better. Under unusually wet conditions they moved over 1,250,000 yards of unclassified material. They sank more than 16,000 feet of underground drainage pipe, in addition to conventional culverts. They finished on time. Their earth moving units were operated on Gulf fuels and lubricants.

Gulf teams up with the Blankenshops of Charlotte, North Carolina, contractors for the grading, drainage and bridge building on a 4.6 mile section of U.S. Route 29. The Blankenshops credit Gulf fuels and lubricants with helping them set a schedule-beating pace on this contract. Left to right: W. C. Ritchie, Gulf Sales Representative; Roy G. Burkhalter, Sr., Gulf Sales Representative; Banks Massey, General Superintendent, Blankenship Brothers; Benjamin M. Blankenship, Partner; Mike Blankenship (son of Ben) on machine.



SEE HOW GULF MAKES THINGS RUN BETTER!

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Department DM, Gulf Building
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**Mail coupon for more information
and valuable maintenance manual**

Your men will appreciate Gulf's 88-page "Contractors' Guide"—a fact-filled, fully illustrated equipment operation and maintenance manual. Send for it now.





ON THE ROAD—Driver on rear-end buggy steers beam around sharp corners on twisting road to bridge site.

REAR END RIDING on a four-wheeled buggy, a 94-ft-long prestressed concrete beam makes it around sharp corners with ease on 30-mile trip over twisting roads from casting plant to bridge site. A driver steers the rear-end carrier like a fireman on the tail end of a hook and ladder truck.

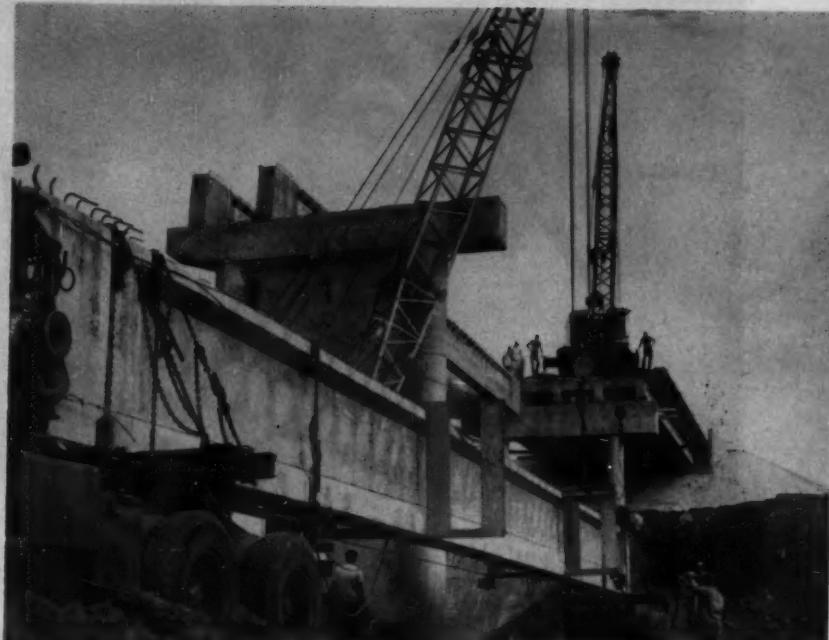
Span, Inc., Dallas, Tex., manufactured the prestressed beams for bridge contractor Concho Construction Co. Problem confronting them when the beams were ready for shipment was the old one of building a boat in the cellar—how to get it out and into the water?

Span engineers worked out the design of the combination pretensioned and post-tensioned beams without trouble, but they called in trucking contractor R. B. Hunsaker to help them on the hauling problem. After some preliminary tests, Hunsaker settled on the rear-end carriers to move the beams.

They rigged up rear-end buggies for two truck-tractors. Drivers practised on dry runs to get the feel of steering the rig, then hit the road with the beams strapped to truck and buggy. Timber sway bracing fastened to the sides of the beam and guyed to the ends reinforced the long sections for the ride.

The truck and rear-end carrier brought the beams right alongside the piers so that they could be lifted into place easily. The rear-end carrier enabled the contractor to do some slick maneuvering in tight quarters. Two truck cranes—an Insley 40-ton rig and a 35-ton Lorain—unloaded the 70,000-lb sections and swung them directly up onto the piers.

Rear-End Buggy Hauls Long Precast Beam



ALONGSIDE PIERS—Buggy maneuvers handily to put beam within reach of cranes.

INTO PLACE—Two cranes lift beam from carrier and place it on top of the piers.



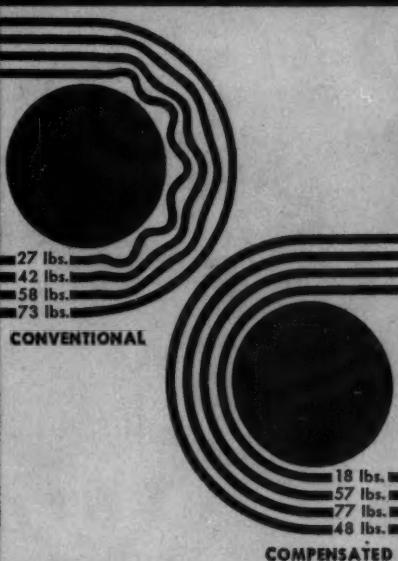


RAY-MAN CONVEYOR BELT ***Lasts Longer on Tough Hauls***

R/M engineering makes the difference with Ray-Man Conveyor Belt. Cushioned strength members give it the resiliency to take the impact of shock loading . . . the flexibility to train better, trough naturally. Balanced *Double-Compensation* relieves outer ply stresses, prolongs belt life under the most rugged operating conditions. R/M's exclusive "XDC" Cover gives Ray-Man extra protection against wear, tear, cuts and abrasion never before possible.

Ray-Man Conveyor Belt is rip resistant. It requires no breaker strip . . . holds fasteners far better than other constructions. Like all R/M heavy duty conveyor belts, Ray-Man is both moisture resistant and mildew-proof. Let an R/M representative show you the engineered advantages of Ray-Man Conveyor Belt and other R/M constructions . . . extra-cushioned Homocord for unusually severe shock loading . . . R/M Tension-Master for extra long lifts, high tensions. Write for Bulletin M302.

**STRESS-RELIEF OF
OUTER PLYS MEANS
LONGER BELT LIFE...
"More Use per Dollar"**



CONTROLLED PLY ELASTICITY

Note how Double-Compensation at right equals ply stresses.

1. Center plies on neutral axis and better protect carry more load.
2. Outer plies stress-relieved by adjusting to tension and compression.

**INDUSTRY'S ONLY
COMPENSATED BELT**

Ray-Man Compensation relieves outer ply stress . . . allows outside ply to elongate more than inner plies as the belt flexes around the pulleys. Inner plies no longer "loaf", but carry full share of the load.

Outer ply is better able to absorb strain and impact of loading, pull as a strength member, protect the inner plies, hold fasteners or splice longer.

And, because Ray-Man is double Compensated—both top and bottom plies stress-relieved—Ray-Man Compensation prolongs belt life, even where operated over reverse bend, snub or take-up pulleys!

R/M POLY-V® DRIVE—MORE POWER IN LESS SPACE

A single unit belt across full width of the drive sheave . . . not an assembly of V-belts . . . gives patented Poly-V twice the tractive surface to deliver up to 50% more power in the same space as a V-belt drive—or equal power in $\frac{1}{2}$ the space! Multiple-belt "matching problems" are eliminated . . . equipment downtime and belt replacement costs reduced to a minimum. Poly-V assures constant belt speed ratios from no load to full load to provide the smoothest and coolest running—longest wearing drive for your heavy duty power driven equipment. Just two Poly-V® belt cross-sections meet every requirement! Write for Bulletin M141.

*Poly-V is a registered Raybestos-Manhattan trademark. Patented.



HOMOFLEX HOSE—HANDLES EASIEST ON THE JOB

R/M's exclusive construction for air, water, other fluids and gases is as flexible as a rope! Homoflex Hose has no pre-set twist . . . coils and uncoils freely in any direction — without kinking. Light in weight, yet strong enough to stand up under the toughest conditions, Homoflex is the easiest handling hose made for rugged general service. Inseparable tube-to-cover bond greatly increases hose life . . . reduces hose costs! Uniform inside and outside diameters make Homoflex easier to couple, too . . . assure fuller, faster flow on every job.

Only R/M offers exclusive Homoflex Construction. Write for Bulletins M694 and M610.

RMP10

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

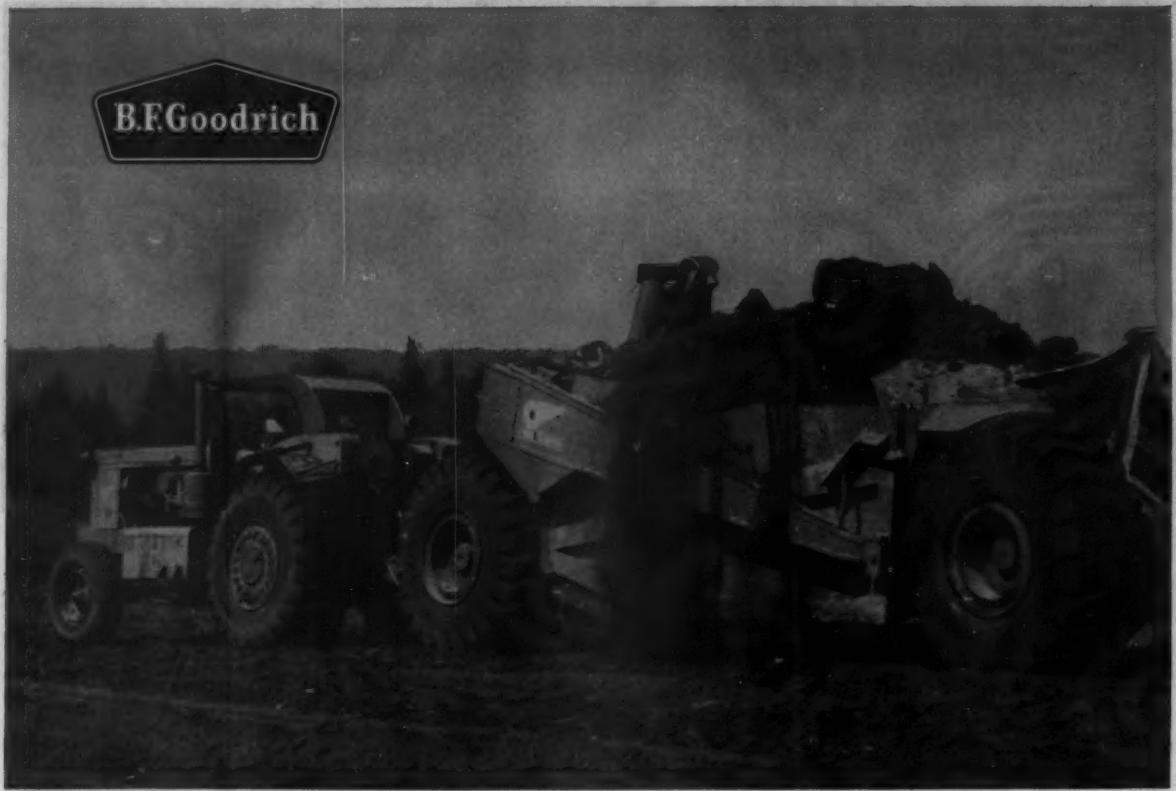
MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

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B.F.Goodrich



World's biggest scraper units need... and use... B.F. Goodrich Hi-Torque brakes

WEISS DAM, ALABAMA—A struck capacity of 40 cu. yds. makes the M-R-S Model 250-HW tractor-scraper the world's largest hydraulic tractor-scraper combination. And with powerful 600-h.p. engines pushing them to speeds of 34 miles an hour, these units need the finest stopping power available.

That's why M-R-S uses new B.F. Goodrich Hi-Torque Brakes. Now at work on the Weiss Dam Project, M-R-S scrapers move heaping loads at high speeds along a $\frac{3}{4}$ mile haul. And they make each round trip with complete safety, because B.F. Goodrich Hi-Torque Brakes stop twice as fast as conventional brakes, with less chance of brake fade.

Exclusive "full-circle" stopping power provides more uniform lining pressure than any other off-road drum brake. In addition, B.F. Goodrich Hi-Torque Brakes have an automatic adjusting feature which eliminates maintenance throughout lining life. Lining changes can be made with standard hand tools, and no lubrication is necessary.

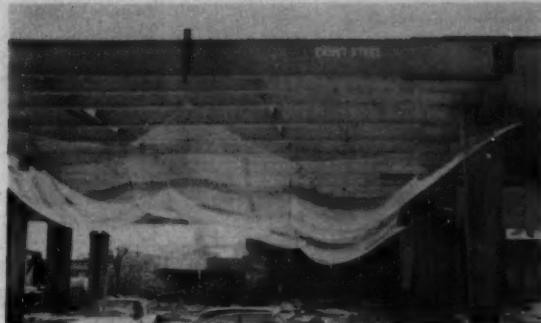
B.F. Goodrich Hi-Torque Brakes on the M-R-S 250-HW tractor-scrapers enable operators to control the placement and depth of spreads, even on steep grades. So next time you buy tractor-scrapers, dump trucks or any other wheeled off-

road vehicles, remember that B.F. Goodrich Hi-Torque Brakes reduce cycle time—provide greater safety—cut expensive maintenance. Ask your equipment manufacturer for details, or write: *B.F. Goodrich Aviation Products, a division of The B.F. Goodrich Company, Dept. CM-59, Troy, Ohio.*



B.F.Goodrich *Hi-Torque brakes*

Safety Net Is Good Bet



LIFE-SAVER—Special lightweight net that saved workman's life hangs from elevated section of highway. It covers 7,200 sq ft.

PASSES TEST—Net sags like fishing net holding prize catch under impact of 300-lb weight dropped 25 ft to test its strength.

IT WAS A 35-FT DROP. The man died within an hour.

A carpenter working on the deck forms, he fell from an elevated section of highway. He was marking a sheet of plywood for an odd-shaped opening in the deck when he moved the sheet slightly and knocked two supporting joists out of place. Without realizing what had happened, he stepped on the loose sheet, and down he went.

This happened on a section of the New York State Thruway near Buffalo under contract to Johnson, Drake & Piper, Inc. of New York City. After the accident, the superintendent and the safety engineer, Wendell Blair, started an investigation.

It didn't take long to figure out what had happened. The question really was: how to prevent a recurrence? Because both the superintendent and the safety engineer knew the same thing could easily happen again—on the same job.

They checked the New York State code requirements and found that false decking or safety

nets were not required by law except where men were working at a height of 50 ft or more. That's the requirement in most states, even though, as in this case, a man can die of injuries sustained in a fall from a much lower level.

So they talked over the possibility of using a commercially available type of safety net. But they discarded this approach—much too expensive. The nets on the market are heavy and bulky. They are designed for high bridge jobs where they will be in one place for a long time. It takes considerable time and effort to string them up. And they pose a storage problem. They deteriorate rapidly unless stored carefully and protected from dampness.

They decided there must be a better way. But what? Nobody had the answer right off the bat. Then one day someone ran across a man who had heard of a big bridge job in Europe on which several men had been killed in falls. Some of the workmen were ex-fishermen, and they talked the contractor into stringing fish nets

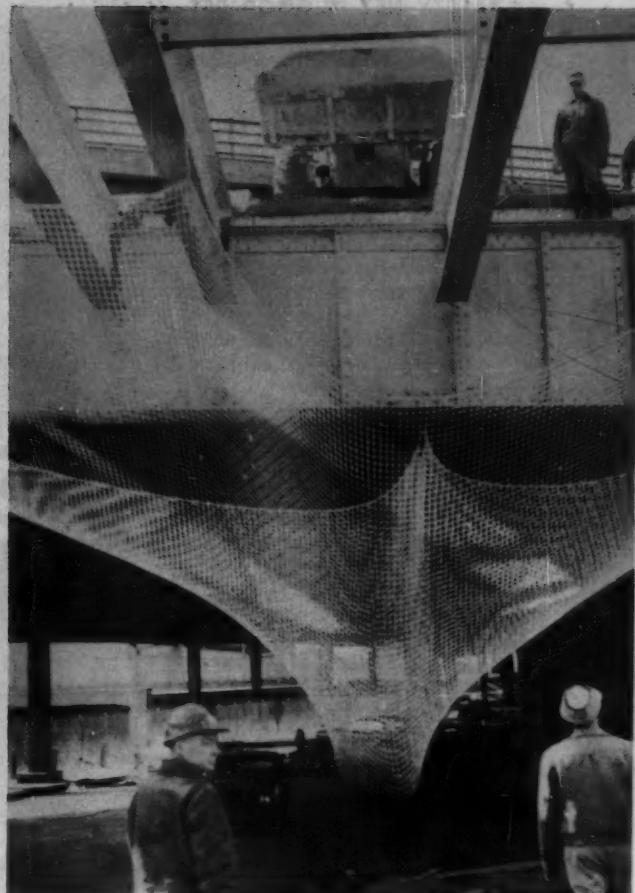
from the bridge as a protective measure. Light and easy to handle, the nets were ideal.

This started them thinking. Why not have a similar net made up? They went to the Linen Thread Manufacturing Co. in New York City to find out if the idea were feasible. They described the problem and discussed a block of details. What size mesh? How strong a cord? What kind of binding? What material?

They worked out each requirement in turn. Mesh size would be about 3-in. square. Just small enough to keep a man's foot from going through and to catch a normal size tool; big enough to minimize fire hazard from sparks thrown by welders working above the net.

The smallest size thread that would serve the purpose would be about 3/16-in. dia. This size cotton thread has a drop test strength of 250 lb. The binding of the nets would be 1/2-in. Manila rope with galvanized eyes at each corner.

JD&P ordered nine 20x40-ft



SAFETY NET IS GOOD BET... continued

nets. They planned on lacing them together to make one 60x 120-ft net, covering an area of 7,200 sq ft.

The manufacturer estimated delivery time at five weeks. In the meantime, the master mechanic on the job laid plans for hanging the nets. After several trials, he came up with a bracket made of 6-in. channels bent into the shape of a square figure nine to hold a winch of the type used on boat trailers. A braided cable with

1,000-lb capacity, passed through the winch, would hoist and hold the net. On the free end of the cable, a snap-type safety hook connected to the net binding.

When the nets arrived, the master mechanic and his men were all set to hang them. They spread the nine units on the ground below the bridge deck and laced them together into three rows of three units each. They tied half-hitches at 6-in. intervals with the $\frac{1}{8}$ -in. manila rope.

They locked three winch brackets to the outside face of each fascia girder. With the cables snapped to the nets, the men lifted them into place and locked the winches.

There was a decided sag in the center of the net. The crew took several long pieces of reinforcing rod and fashioned hooks on their ends. They lowered the rods down between the expansion joint beams near the center of the deck and hooked the ends around the binding of the net. Raising and fastening the hooks close to the bottom of the beams took care of the sag in the net. It took a four-man crew about two hours to get the nets ready and hoist them into place.

Testing the Net

Finally, the JD&P crew tested the net by dropping a 300-lb weight into it from a height of 25 ft. The net bulged out like a fisherman's net with a prize catch, but it took the shock.

The cost of the net was quite reasonable. Each of the nine sections cost \$110, including freight charges. The winches cost \$8 each, in a carton of six. The cost of handling and stringing the net worked out to about $1\frac{1}{2}$ ¢ per sq ft. Total cost for just this one job was \$1,150.

Only remaining problem was how to store the nets when not in use. Each net weighs 76 lb. After some experimenting they found they could roll each net up separately and fit it into an ordinary canvas duffel bag. The bags are easily handled and keep the nets dry.

Was the net worth the expense? Well, the payoff came just a few weeks after it was put up. A workman fell from the deck again—this time 40 ft above the ground. But he clambered out of the net and returned to work, unharmed. So the net has saved the contractor from being charged with thousands of dollars of compensation on his insurance record—and what is much more important, it saved the man's life.

The contractor is finding that the net benefits him in another way, too. He calls it "net profit." The net has indirectly cut his forming costs. The men are more relaxed and sure-footed with the net under them. As a result their efficiency has shot up, and forming costs have dipped.

ROCKFORD



OVER-CENTER Gear Tooth Drive CLUTCHES Provide for CLOSE ADJUSTMENTS

A conveniently accessible adjustment ring provides for infinitely close adjustment—in ROCKFORD Over-Center CLUTCHES—without special tools. Fine adjustments can be made, and automatically maintained, without releasing or engaging separate locking devices which formerly limited adjustments to the spacing of notches or holes. This is but one of several exclusive features of ROCKFORD Over-Center CLUTCHES.

SEND FOR THIS HANDY BULLETIN
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

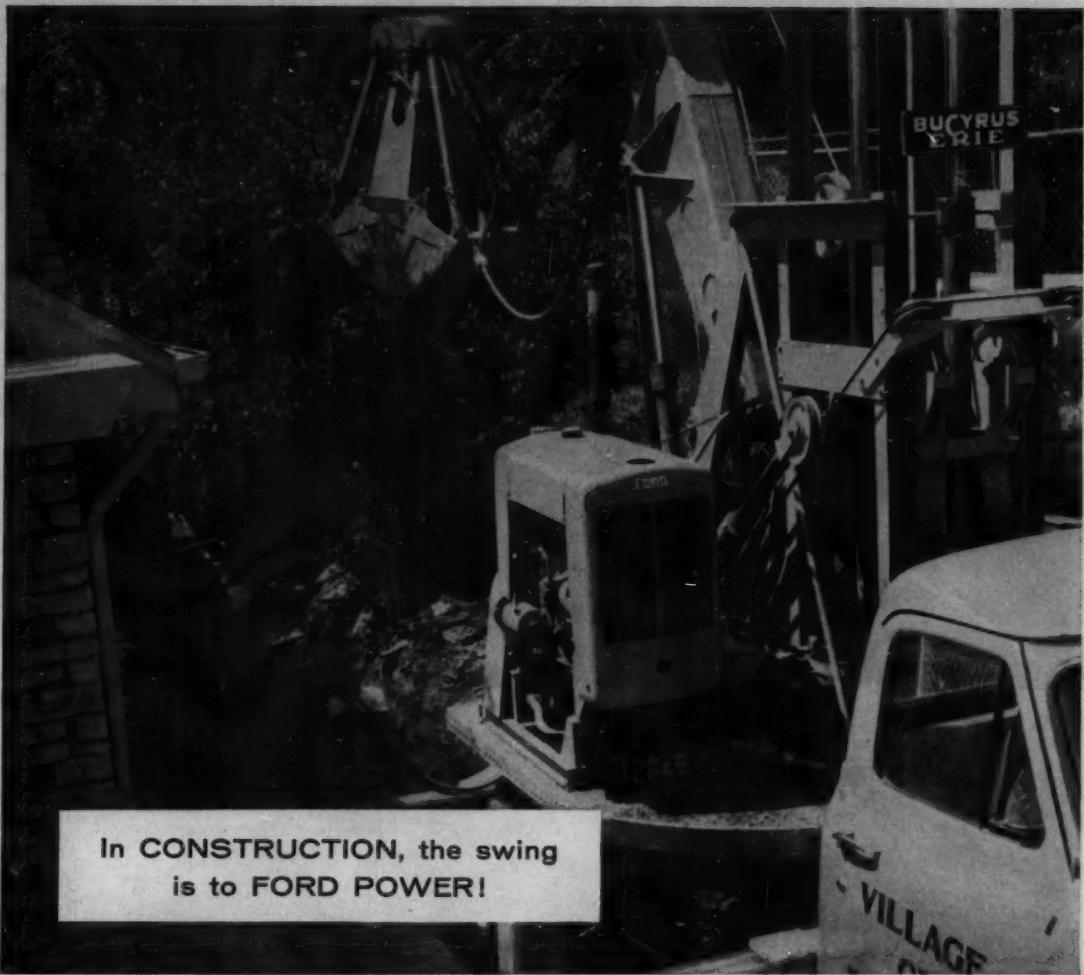
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CLUTCHES



Page 192—CONSTRUCTION METHODS and Equipment—May 1959



In CONSTRUCTION, the swing
is to FORD POWER!

WHY? Ford Engines are tough! Ford Service is everywhere!

Ford Industrial Engines are becoming the solid favorite on construction jobs everywhere—primarily because of their many durability features.

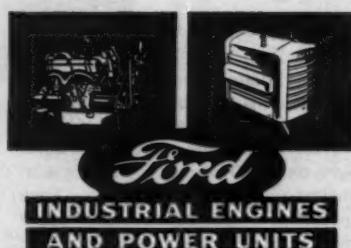
You'll find, for example, that every Ford Engine has Short Stroke design that cuts engine friction, reduces wear . . . deep-block construction that minimizes vibration, lengthens bearing life . . . and overhead-valve design for greater operating efficiency and economy.

Ford Engines range from 134 to 534 cubic inches . . . including two modern Ford Diesels and three

Super Heavy Duty V-8's—all available as power units or complete engine assemblies. To meet special fuel needs, gasoline engines can be adapted to LP- or natural gas.

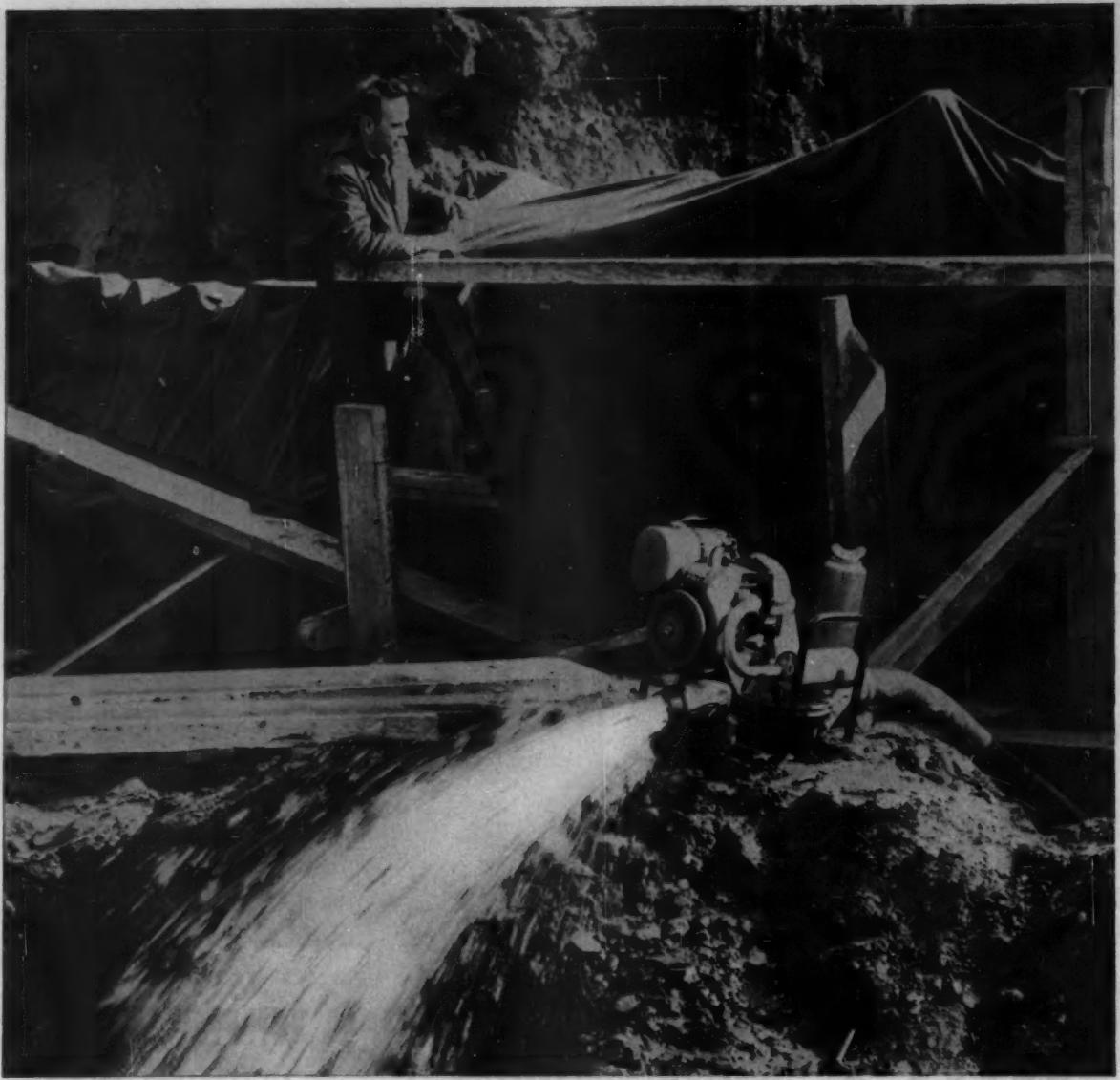
As a Ford power user you need never concern yourself about costly downtime . . . for there's always a Ford Dealer nearby to give you the service you need *when you need it*.

Little wonder more and more profit-minded operators are swinging to Ford every day. For original installation or re-powering, specify Ford Industrial Power.



INDUSTRIAL ENGINE DEPARTMENT • FORD Division of FORD MOTOR COMPANY
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USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

Easiest Way to do Hardest Pumping

It doesn't matter where you pump or what you pump, the Homelite Diaphragm Pump is the Time-saver and Money-saver for continuous heavy-duty work. Weighs only 120 pounds, complete with Homelite quick-starting engine . . . less than $\frac{1}{2}$ the weight of most diaphragm pumps of equal capacity. You set it up anywhere, fast. You do your pumping, fast. Handles anything . . . water, sand, mud, muck, solids. Manual throttle con-

trol adjusts engine speed for full 5,000 G.P.H. capacity pumping or handling small seepage flow . . . gives greater fuel economy. Suction lift of 28 feet is guaranteed. You get total heads up to 50 feet, including friction. Flapper valves have special self-cleaning action to prevent clogging. For longer wear, gears operating in oil are totally enclosed. For steady footing, pump is mounted on vibration-proof spring skids. See it in action today.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.



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CARRYABLE
PUMPS GENERATORS • BLOWERS
CHAIN SAWS

HOMELITE • A DIVISION OF TEXTRON INC., 1005 RIVERDALE AVE., PORT CHESTER, N.Y.
In Canada — Terry Machinery Co., Ltd.

3

New International® Earthmovers

new CAPACITIES

(24 yd. scrapers, 27 yd. wagon)

new POWER (375 hp)

new SPEEDS (to 29.1 mph)

Higher speeds possible with optional equipment.

International 24 cu. yd. 295 Payscraper

Heaped: 31 cu. yd.
Overall length: 44' 8".



New high visibility color. Optionally available on all three models in either Federal yellow or International Harvester red.

NEW positive push-type ejection assures quick clean dumping of all materials.

NEW advanced lift frame construction with A-frame-type gooseneck that: 1) increases visibility; 2) distributes weight evenly along cross tube; and 3) protects sheaves of bowl lift system.

NEW full 90° turns with power steering.

NEW

375 hp DT-817 turbocharged 6-cylinder diesel engine. See page 4.

NEW cycle-shortening haul speeds to 26.2 mph plus unmatched maneuverability.

NEW exclusive tapered bowl. See next pages.

NEW high 98" apron opening. See pages 2-3.

NEW

automotive comfort and control features
... 16-adjustment bucket seat ... reach-easy controls ... unobstructed vision ... air brakes ... flush deck.

NEW

Model 280 cable control unit ... finger-tip control ... fast acting ... high capacity ... simple adjustments ... less maintenance.

See 3-axle models on inside pages...

27 cu. yd. International[®] 495 Paywagon[®]

Heaped: 40.5 cu. yd.
Payload: 40.5 tons.
Overall length: 50'4½".



Here in the 27 cu. yd. International 495 Paywagon is everything that's new and productively different in bottom dump design. New 375-hp engine for greater power per struck yard than any comparable rig. New higher side and rear end clearance to roll away from any dumped load. New power-opened clamshell doors for positive controlled dumping. New wiper plates put 100% of each load on the fill. New automotive comfort and control features that let the operator produce more with less effort. New full 90° turning in either direction. New low design for haul road stability.

New exclusive power-opened clamshell doors afford positive controlled dumping. Operator spot dumps entire load or windrows material in lifts from a few inches on up. Wiper plates shave all material from doors as they raise. Doors gravity close, eliminating complicated mechanism.

375 HP 495 prime mover gives both 495 Paywagon and 495 Payscraper more hp per struck yard with less gross weight per hp than any similar sized earth mover. Speeds to 29.1 mph, 10'8½" wheel base. Full 180° non-stop turns can be made within 39'11¾".

Unmatched 60" rear end dumping clearance lets rig pull fast from fill with no dangling doors dragging on dumped material. Open rear frame lets loader spillage fall through — prevents buildup of "free loading" material.



NEW

**high speeds
big capacities**

big capacities

fast dumping unmatched control

This new International 495 Payscraper boils a heaped load into a 24 cu. yd. bowl in less time than any other three-axle scraper in its class and hauls it at speeds up to 29.1 mph. The trailing unit, common to the 295 Payscraper, offers this unmatched combination of features that cut dirt costs; big 131-in. cutting width . . . tapered bowl permits efficient ejection of all materials with equal ease . . . positive forced ejection . . . improved lift frame construction . . . full 90° turns . . . more hp per struck yard than all competitive units . . . wheels and bowl leveling adjustment . . . advanced sheave bearing design . . . and custom designed cable control unit.

Exclusive tapered bowl design: 1) permits scraper and pusher to work inside cut for best traction, less wear on tires, and tracks; 2) causes dirt to boil toward center, reducing side spillage; 3) extra wide bowl bottom provides wider spread, speeds dirt breakaway and lets scraper work cuts against banks.

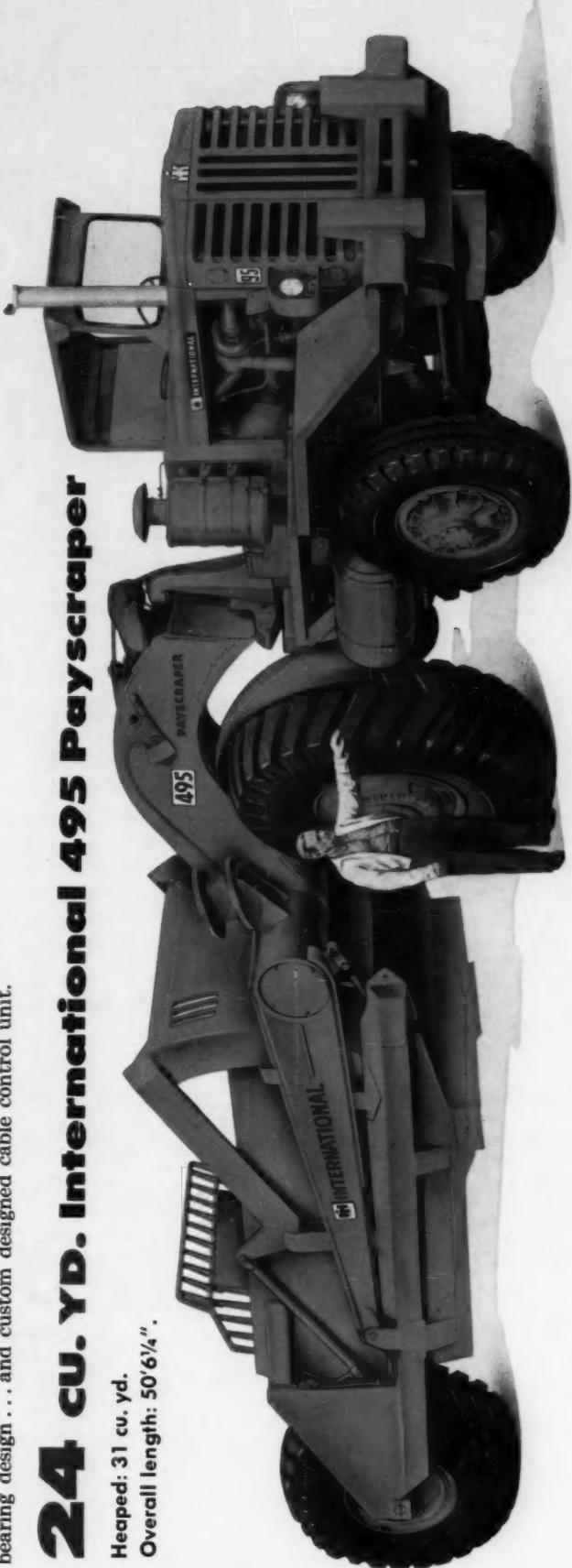
Positive forced ejection dumps all materials — even wet or frozen clay and gumbo — cleanly and quickly. Six large ball bearing mounted rollers center and guide ejector gate, have 240-hour lube intervals.

Gaping 98" apron opening plus no bowl cross member permits sure ejection of all materials. Apron opened by exclusive, rear-controlled mechanical linkage. Apron is synchronized with ejector for positive controlled spreading.



24 cu. yd. International 495 Payscraper

Heaped: 31 cu. yd.
Overall length: 50' 6 1/4"

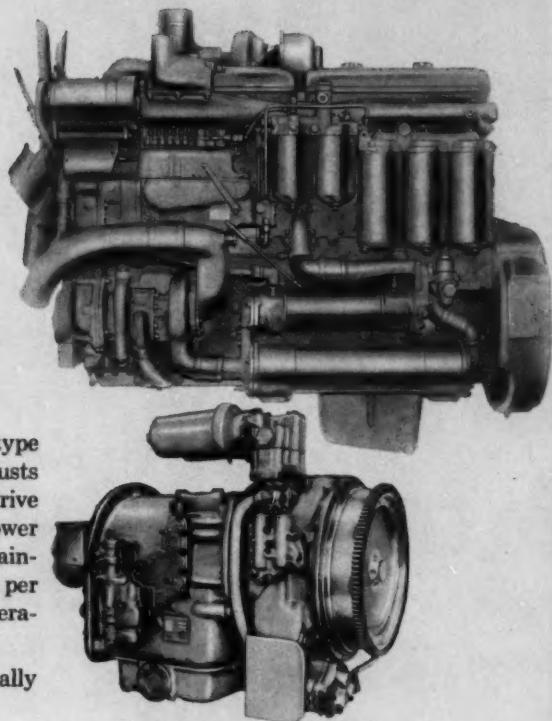


New Turbocharged International DT-817 powers all three giant earthmovers

- Develops 375 hp @ 2100 rpm
- Direct push-button, 24-volt starting
- Positive valve rotators — increase valve life
- Aluminum alloy pistons for fast heat dissipation
- Wet sleeve construction provides additional cooling
- Fully counterbalanced crankshaft for smooth engine performance
- Dual intake and exhaust valves for peak engine efficiency
- Twin plunger injection pump precision meters fuel
- Hang down type replaceable filters for maximum fuel and oil filtering efficiency
- Tri-metal crankshaft bearings for long trouble-free service

Both prime movers are available with 4-speed, planetary type torque converter power shift transmission. It automatically adjusts output torque and speed to fit load requirements. Torqmatic drive makes more power available over the entire range; applies power smoothly and continuously, resulting in less wheel slippage; maintains high tractive effort; and cuts the number of gear shifts per cycle, letting operator concentrate on loading and spreading operations.

A constant mesh 9-speed manual shift transmission is optionally available on both prime movers.



See your International Construction Equipment Distributor for complete information on these NEW International Earthmovers

International®



Construction Equipment

International Harvester Co. • 180 N. Michigan Ave., • Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheeler Tractors . . . Self-Propelled Scrapers and Bottom Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

Construction Men in the News . . .

Turner



ROBERT B. HOLLISTER will be project manager for the construction of the Lincoln Center for the Performing Arts in New York City. He will represent the joint venture of Fuller-Turner-Walsh-Slattery.

Hollister comes to the project from Philadelphia where he headed all area construction for the Turner Construction Co. He joined Turner as a field engineer in 1936 after leaving Rensselaer Polytechnical Institute in Troy. In 1939 he was named an assistant superintendent for construction of the DuPont exhibit building at the New York World's Fair.

When World War II broke out, Hollister became a Lieutenant Commander in the Civil Engineering Corps of the United States Navy. He headed Navy construction of submarine and air bases in Australia and, later, the construction of shore base facilities in the Philippine Islands.

In 1946, he returned to Turner and was sent to Philadelphia to manage many of the Turner projects in the area. He was named chief engineer of that area in 1951.

Work will get under way on the Lincoln Center job on May 14 when President Eisenhower will participate in public ground-breaking ceremonies. The Center, which will occupy a 12-acre site, will consist of a hall for the New York Philharmonic orchestra, a new Metropolitan Opera House, a Repertory Theater, educational facilities for the Juilliard School, a Theater for the Dance, a Cham-

ber Music and Recital Hall, and a Library-Museum of the Performing Arts.

Raymond

G. WILLIAM BAILEY and WARREN N. RIKER are new vice presidents of Raymond International, Inc.

Bailey, who has been Raymond's chief engineer since 1954, will take charge of a newly established heavy construction division, organized to manage special domestic construction projects.

He joined Raymond in 1940 as an overseas project engineer, later became an estimating engineer, and, still later, chief estimator.

Riker joined Raymond in 1946 as chief engineer and was appointed New England district manager eight years later. Since 1957 he has served as project manager on special construction in the Middle East. Before joining Raymond, Riker was chief engineer for a New York City contractor.

Briscoe

WILLIAM F. KELLY is the new president and ALUSTIN HELLE, the new vice president of the Frank Briscoe Co., New Jersey builders.

Kelly, who started with the company as a layout engineer, later served as vice president and general manager before being elected to the presidency.

Helle joined Briscoe 15 years ago as a carpenter foreman. Serving under Kelly, Helle will head all of the company's construction.

Concrete Institute

PHIL M. FERGUSON is the new president, and LEWIS M. TUTHILL, the new vice president, of the American Concrete Institute.

Ferguson, a professor of civil engineering at the University of Texas, was elected to a 1-yr term to succeed Douglas McHenry.

Tuthill, a concrete engineer, Division of Design and Construction, California Department of Water Resources, was elected to a two-year term as vice president.

Aberthaw

DAVID O. MCKINLEY is the new executive vice president of Aberthaw Construction Co., Boston, Mass.

McKinley joined Aberthaw in 1955 as chief estimator and, a short time later, became vice president. A construction man for more than 17 years, McKinley formerly was with Charles Logue Building Co. and with Turner Construction Co.

Daniel

GEORGE McDougall is the new chief engineer of the Greenville Division of Daniel Construction Co.

McDougall, associated with Daniel since 1957, has supervised construction of many of the firm's largest industrial projects. He now is completing a \$40-million paper mill in South Carolina.

Mid-Valley Utility

E. D. HOEKSTRA is the new manager of industrial relations of Mid-Valley Utility Constructors, Inc. Hoekstra for the past 12 years had been associated with the H. K. Ferguson Co., Cleveland engineers and builders.

Hoekstra in 1956 was named by Secretary of Labor James P. Mitchell as a member of the United States Executive Reserve, a group of private citizens chosen for possible appointment to key government posts in the event of a national emergency. During World War II he served in Washington as a labor officer for the Army's Chief of Engineers.

Bechtel

JEROME W. KOMES is the new senior vice president, and ROBERT A. BOWMAN, a new vice president of Bechtel Corp., San Francisco.

Komes also becomes executive vice president of the company's international subsidiaries and affiliates. He will have operational responsibilities for the overseas activities of Bechtel. He will take over many of the duties of the late George S. Colley, Jr., who was killed last July during the revolt in Iraq.



Only a Jaeger can deliver 600 cfm of air at 1700 rpm

Using the same Model 6-71 GM diesel engine, a Jaeger "600" rotary delivers the same air volume at 1700 rpm that other compressors must speed up to 1800 rpm to produce. You save fuel and wear, with as many as 48,000 fewer compressor revolutions, every day you work. • Jaeger 125, 250 and 365 cfm rotaries have this same high efficiency characteristic. Ask your Jaeger distributor to demonstrate — or send for Catalog JCR5.

The Jaeger Machine Company, 800 Dublin Ave., Columbus 16, Ohio

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Aeroquip Corp.: The following nine distributors have been appointed: Gilian Auto Supply, of Fort Myers, Fla.; Air Cleaner Sales, Inc., of St. Paul, Minn.; Joint & Clutch Service, Inc., of Indianapolis, Ind.; Johnson Hydraulic Equipment Co., of Minneapolis, Minn.; Reliable Rubber Products Co., of Dayton, Ohio; Arrow Engine Service, Inc., of Milwaukee, Wis.; Eggiman Motors, of Madison, Wis.; R. L. Miller Co., of Pittsburgh, Pa.; and J. V. Tripoli & Co., Inc., of Buffalo, N. Y.

Koehring Co.: The Kwik-Mix division has appointed three new distributors: Wade Masonary Supply, of Russellville, Ark.; The Wepco Equipment Co., of Cleveland, Ohio; and Fincham Equipment Co. of Denver, Colo.

Bucyrus-Erie Co.: Street-Robins-Morrow, Ltd., of Calgary, Wetaskiwin, and Lethbridge, Alta., has been appointed a distributor in Alberta for Bucyrus-Erie Co. and for its Canadian subsidiary, Bucyrus-Erie Co. of Canada, Ltd.

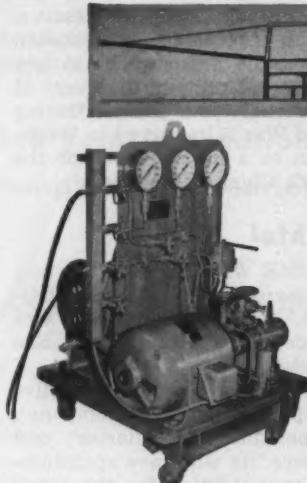
The Oliver Corp.: Carr Equipment Co., Inc., of Columbus, Ohio, has been appointed distributor of Oliver industrial crawler and wheel tractors with allied equipment for 25 Ohio counties.

General Motors Corp.: The Detroit Diesel Engine Division has appointed two distributors: Keystone Diesel Engine Co. of Wexford, Pa., will handle GM diesel engines in Western Pennsylvania; and the Dixie Engine Co. of Atlanta, Ga., will handle the Western Georgia territory.

On the Sales Front

The Frank G. Hough Co.: Herman R. Brown, former western regional manager, has been appointed sales manager of the Pay-

HYDRAULIC JACKS AND PUMPS FOR ANY PRESTRESS JOB



The Corbetta Construction Company used our center hole rams and hydraulic pumps to meet the challenge of cantilever design in the new Pan American World Airways terminal at New York's International Airport.

Our complete line of hydraulic equipment is competitively priced and designed to meet your specific application on any prestress job. Your inquiry is invited.



INTERCONTINENTAL EQUIPMENT CO., INC.

Prestressed Concrete Division
120 Broadway, New York 5, N. Y.

ASSOCIATE MEMBER PCI



A Fruehauf Dump-Trailer For Every Tough Job!

Do The Work of Two or More Trucks—At Less Cost—With One of These

**Fruehauf
Trailers**



Cable Dumps—Simple mechanism—low initial cost—low upkeep—full use of bridge formula laws—low Trailer weight—up to 4,000 pounds of extra payload—unmatched maneuverability on rough ground or in tight places. Trailer can be dumped with tractor jackknifed up to 90° angle—cable mechanism can be used to pull either tractor or Trailer out of rut or hole—single or tandem axle units available.



Hoist-Type Dumps—Wide range of designs—steel units (shown above) or frameless aluminum units (shown below) with up to 3,500 weight savings—single or tandem axle suspensions—single or twin front-mounted or under-mounted telescopic hoists—sand and gravel units or rugged rock bodies.



Hopper-Type Dumps—For sand, gravel, aggregates—frameless high-tensile steel body—designed for the strain of rough terrain—steeply-pitched inner surfaces for fast unloading—gate trip mechanism with ten control settings for varied unloading speeds.



FRUEHAUF ALSO BUILDS A FULL LINE OF CARRYALLS, PLATFORMS, AND CEMENT AND HOT COMMODITY TANKS FOR CONSTRUCTION WORK!



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Quality crane carriers . . . tailored to your particular needs. Not just assembled . . . precision crafted with top-quality components. A full line of carriers for cranes and shovels from 12½ to 60 tons . . . in four, six and eight-wheel models . . . gasoline, diesel, propane or self-propelled. For unmatched performance, durability and low-cost operation specify Hendrickson Custom Carriers.

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SALES AND SERVICES . . .

continued

loader Division. Kenneth B. Larkin, formerly a district manager, becomes eastern regional manager. Robert L. Knox has been transferred from eastern regional manager to central regional manager. Donald O. Ross becomes western regional manager. Bruce C. Dennett, formerly sales engineer, becomes assistant to the regional managers. Charles J. Bernard, manager of the order and distribution department, will assume direction of manufacturers export sales as well as scheduling operations.

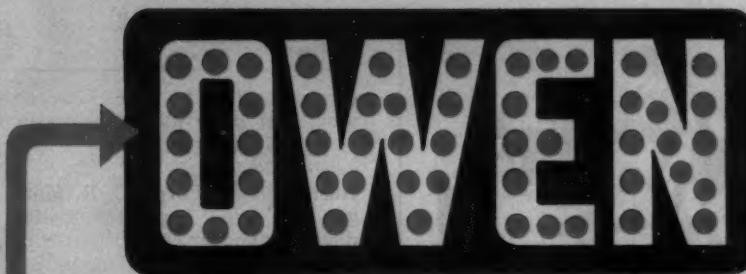
Olin Mathieson Chemical Corp.: James L. Wetzel has been named director of sales for the Explosives operations, Energy Division. He succeeds Frank J. Monaghan, who becomes a special assistant to the vice president of the Explosives operations and will retire on June 1.

The Lincoln Electric Co.: Donald F. Hastings has been named district manager in Moline, Ill. He will be replaced in the San Francisco office by Donald G. Wright, who will move from Chicago.

Unit Crane & Shovel Corp.: The following appointments are announced: Vernon S. Barnes, director of marketing; J. W. Lenahan, sales manager; Troy Cook, assistant sales manager; LeRoy Schaefer, parts sales manager; Gene Glisch, service manager; Carl Fairbanks, assistant chief engineer; William L. Redditt, Jr., eastern district representative.

Warner & Swasey Co.: Lester M. Cole, general sales manager, was elected vice president in charge of sales of the company following the annual shareholders meeting, held recently in Cleveland.

Atlas Powder Co.: Three district sales managers have been appointed in the Explosives Division. Stephen M. Wilson, Jr., formerly manager of the Joplin, Mo., district has been named manager of the eastern district with headquarters in Wilmington, Del. M. A. McDuff, who has been sales supervisor in the Houston, Tex., area of the Joplin district, was appointed manager at Joplin. Walter R. Law, formerly a special



the Greatest Name in Buckets All Over the World

Wherever you go, wherever you see excavating or handling of materials . . . there you will find one or more OWEN Clamshell Buckets on the job. Faith in their performance, confidence in their sturdy construction, and complete assurance in their ability to complete contracts satisfactorily and "on time" . . . these are the reasons that powerful, rugged OWEN Clamshell Buckets dot construction jobs all over the globe.

You'll get more from an OWEN in every way — Longer Life, Larger Loads, More Economical Operation. From drawing board to finished product, OWEN lives up to its great name in every way. Put the real worker on the end of the boom! — get a Great OWEN Clamshell Bucket without delay.



OWEN MATERIAL HANDLING BUCKETS

OWEN'S new center line reeving principle, now incorporated in a completely redesigned line of material handling buckets, is one factor that increases cable life of these buckets up to 75%. A full line now available from $\frac{1}{4}$ cu. yd. up to 10 cubic yards.

OWEN GRAPPLERS

OWEN'S patented independent tine action 4-prong grapple has proven itself invaluable in land clearing operations. Its independent tine action guarantees positive contact and tremendous gripping power on each of the four tines, no matter how irregular the shape of the object may be.

Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.



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BREAKWATER AVENUE, CLEVELAND 2, OHIO

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**NEW****TROUBLE-FREE STEAM CLEANER**

The Turbo Steam Cleaner is made for continuous rough service. It takes care of all cleaning, degreasing, paint-stripping and phosphatizing jobs faster, better and cheaper than any other steam cleaner. Quickly pays for itself: Low fuel consumption; detergent savings; low maintenance. Simple construction. Many automatic safety features. Nothing cleans like steam and no steam cleaner cleans like a Turbo. Oil-fired and electric models. Send for illustrated folder.

TURBO STEAM CLEANERSTURBO MACHINE COMPANY
LANSDALE, PA.**SALES AND SERVICE...****continued**

representative in the Chicago area, has been named manager of the Pittsburgh district.

Harnischfeger Corp.: C. R. Morgan has been appointed Dallas district manager of the Construction and Mining Division.

H. K. Porter Co.: Gordon N. Dow has been named general manager and R. Rex Hartup general sales manager of the Leschen Wire Rope Division.

Westinghouse Air Brake Co.: Richard H. Koehler has been general sales manager of the Le Roi Division. He succeeds Jack E. Heuser who has resigned from the company.

In the Main Office

U. S. Steel Corp.: Harry M. Francis has been named executive vice president of the American Steel and Wire Division of U. S. Steel. He has been vice president—sales for the past 13 years and has been associated with American Steel and Wire for over 43 years.

Universal Mfg. Corp.: Robert L. Carbeau has been elected president of the company to succeed J. A. Kirkpatrick who recently resigned. Arthur M. Capper has been appointed to the board of directors.

Associations

Hoist Manufacturers Association: The following officers were elected at the recent annual meeting of the Association: Milton L. Aitken of Robbins & Myers, president; John S. Jackson of Shepard Niles Crane & Hoist Corp., vice president; Carl O. Hedner of Yale & Towne Mfg. Co., director; William C. Miles of American Engineering Co., director; and Raymond C. Blair of Chester Hoist Division, director.

Special Mention

Massey-Ferguson, Ltd.: Massey-Ferguson has bought control of F. Perkins, Ltd., of Peterborough, England, one of the world's important diesel engine manufacturers. Profits of the British firm were about \$1 million in 1959. The company employs about 5,000 people. It recently acquired production toolage from the Oliver Corp. of Chicago of their diesel marine outboard motors.

**FRAMES AND ARCHES**

Condensed Solutions for Structural Analysis

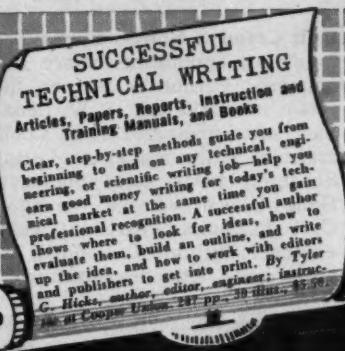
JUST PUBLISHED — Shows how to save time in analysing complex structures by using a new concept in solutions of frames and arches of constant or variable cross section. Gives over 400 condensed solutions for twenty principal types of statically indeterminate frames and arches—useful in steel, concrete, and wood design. Includes comprehensive charts and tables to facilitate analysis of launched frames and arches. By Valerian Leontovich, Civil Engineer. 494 pp., 523 illus. \$20.00.

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JUST PUBLISHED — A clear, practical, and thorough guide that helps you avoid legal entanglements and costly litigation in the many areas of possible conflict of interest in the construction field. Makes clear the rights and liabilities of contractor, designer, owner, and financier. Includes many typical cases and features a special section on boundary rights. Requires no special legal knowledge or training. By Walter C. Sadler, Engineering and Legal Consultant. 387 pp., 76 illus. \$8.50.

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2ND EDITION JUST PUBLISHED — Shows how to make sound, accurate building construction estimates. Covers estimating techniques, plan reading, contracts, quantity surveying, expense and summary sheets, foundations, floors and roofs, and other topics. Includes specimen sheets, hundreds of terms, essential data, and two modern building plans. Revised edition covers advances in hardware, plumbing, heating, air conditioning, and other areas. By G. H. Cooper, Building Contractor, 2nd Ed., 398 pp., illus. \$7.50.

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Please send information on EFCO Bridge Column Forms, and address of nearest sales office.

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Heil HMT-11 Body hauls as much as 1500 lbs. additional legal payload because the body is built lighter with USS MAN-TEN High Strength Steel.



Man-Ten Steel boosts legal payload 1500 lbs.

Robert Hawthorne, Inc., of Philadelphia, one of the largest haulers in this area, wanted the lightest possible body, since they traverse the public streets and roads.

The Heil Company had the right truck body. The new Heil HMT-11, made with USS MAN-TEN High Strength Steel, permitted an extra 1000 to 1500 lbs. per payload.

The greater strength of MAN-TEN Steel permits a thinner gage floor, subframe and sides. The body is just as strong, but because it is made with thinner steel plates it is as much as $\frac{1}{8}$ lighter than an ordinary body. The weight removed from the body goes into the payload.

This truck body will need less maintenance because USS MAN-TEN Steel has good resistance to atmospheric corrosion, abrasion, impact and fatigue.

Ask your equipment supplier about High Strength Steel construction. There are three brands of USS High Strength Steel—MAN-TEN, COR-TEN and TRI-TEN. Each has its own characteristics that make it ideal for certain applications in trucks and truck bodies. Ask, too, about USS "T-1" Constructional Alloy Steel and USS Stainless Steel. See how these steels can reduce weight, increase strength, and lower the cost of your trucking operation.

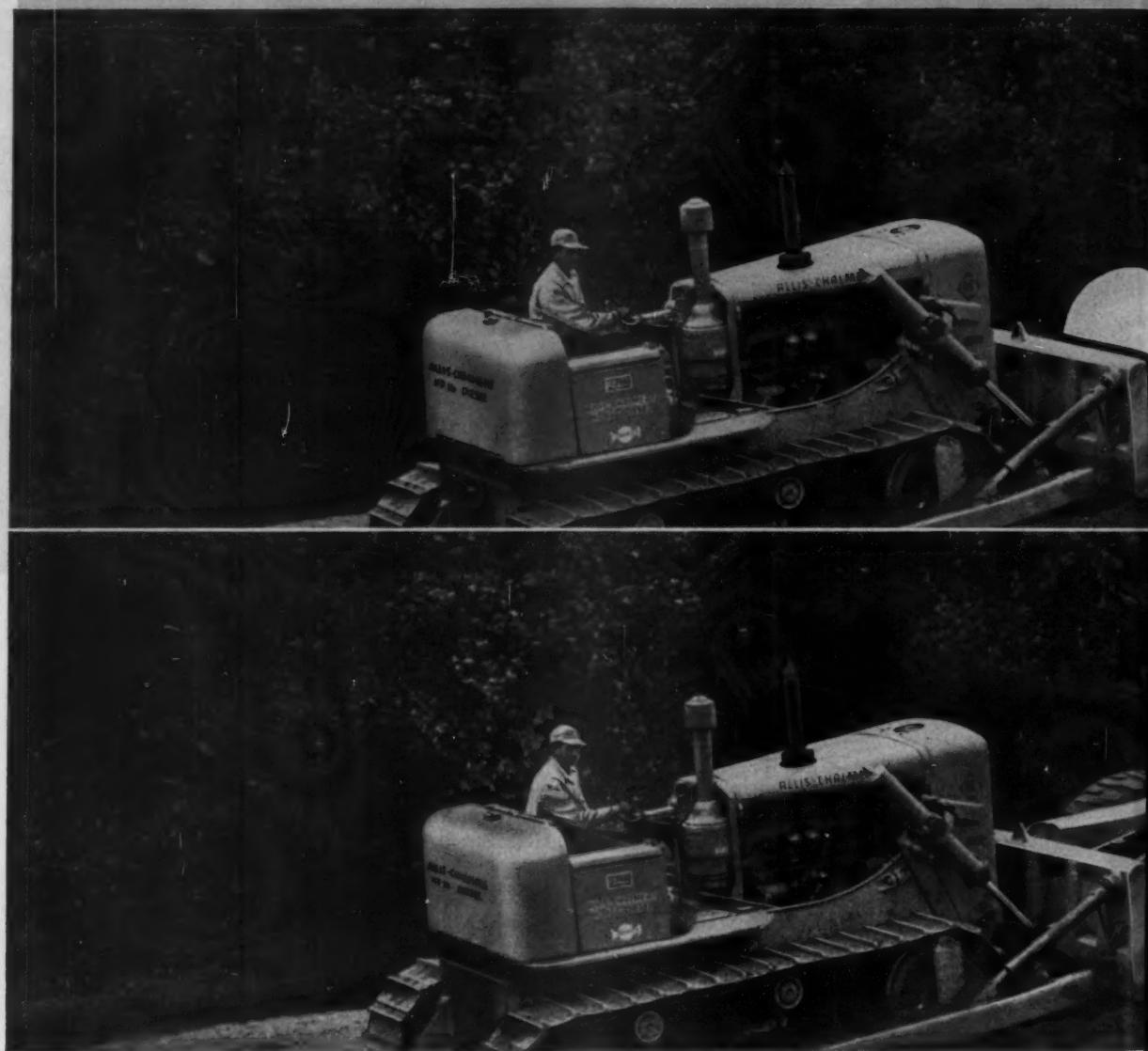
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Tennessee Coal & Iron—Fairfield, Alabama
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United States Steel

Same cut... same pusher 5% more dirt in 42% less time



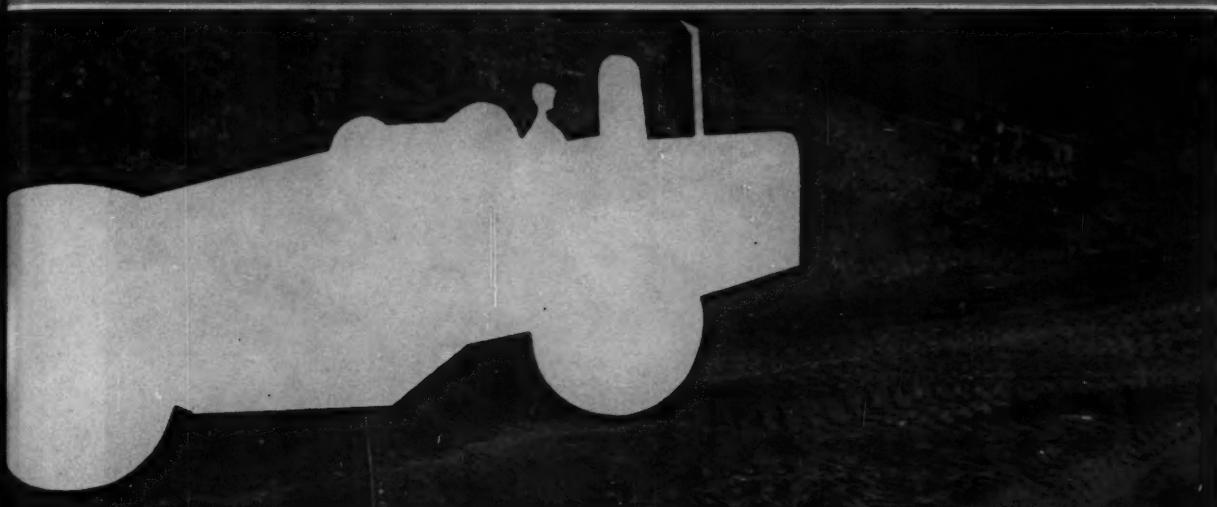
You may be surprised . . . may even challenge these facts. But facts they are, and we invite you to check them on *your* job, with *your* stop watch. Call your nearby Allis-Chalmers dealer now. He'll provide the TS-160 . . . when and where you say. *Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.*

.....move ahead with **ALLIS-CHALMERS** power

**DAY IN...DAY OUT, THIS ALLIS-CHALMERS 9½-YARD TS-160
OUTWORKS ITS LEADING COMPETITOR...AND DELIGHTS ITS OWNER***

This is no demonstration setup. It's a road job* where these two self-propelled scrapers worked every day . . . push-loaded by the same Allis-Chalmers HD-16 torque converter tractor. That made every loading cycle about as identical as

they'll ever get. And hour after hour, the TS-160 moved out of the cut with a heaped load in an average of 42% less time than its 9-yard companion of another make. *This is extra work power you can turn into profit!*



Scraper X, heaped loads in 35 seconds, 9 yards heaped



TS-160, heaped loads in 20 seconds, 9½ yards heaped

* Further details
on request



TS-160

9½ yards
heaped,
155 net engine
horsepower



Stronger for a growing world

Construction Equipment News . . .

Bigger Wheel Digs Deeper Ditches

A new, larger wheel for Barber-Greene's 774 ditcher gouges out ditches 7 ft deep and 18 to 30 in. wide. Stay rod supports of the wheel assembly are made of steel tubing instead of angles. Wheel rims are cut from one solid plate of manganese steel, and the segment teeth sections that drive the wheel are welded to the rims. Each of the 14 buckets is attached to the wheel by 10 heat-treated bolts.

The new wheel has hydraulic hoists and flexible mountings that permit a 5-deg difference between centerline of the wheel and the chassis while digging. The balance point remains within 4 to 6 in. of the center of the tracks regardless of bucket equipment used. No counterweights are used. Forward crowding speeds range from 0 to 25 fpm. Accessories for gumbo and rock are optional. — Barber-Greene, Aurora, Ill.



Crane Converts to Shovel, Hoe or Clamshell

The new Link-Belt LS-78 shovel-crane may be rigged as a lifting crane, clamshell, dragline, or hoe. It has three different under-carriages from 7 ft 10 in. to 9 ft 8 in. wide and from 11 ft 4 in. to 13 ft 7 in. long. The long-wide undercarriage is designed for fast dismantling for transportation.

The two-piece, angle-type crane booms have box-lattice construction. A retractable high gantry is optional; it can be used to lower counterweights for removal. The unit has power hydraulic steering and spring-applied digging brakes that engage automatically to hold the machine when travel jaw clutches are disengaged. Upper machinery shafts, gears, and clutch shells can be pulled without removing major portions of the cab. A wide range of optional equipment is available.—Link-Belt Speeder Corp., Cedar Rapids, Iowa.

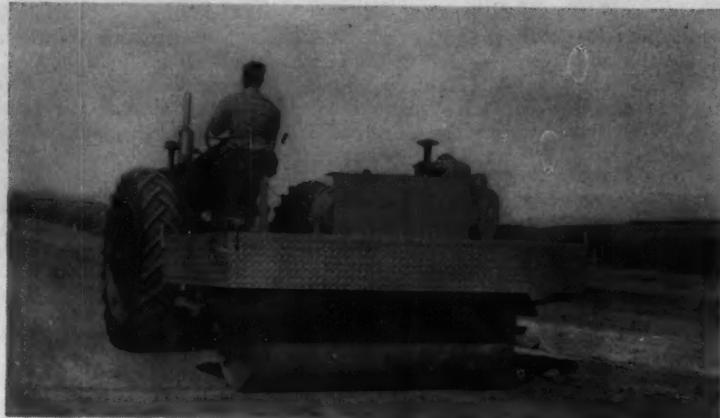


New I-H Trucks Range From Light to Heavy

The new B-line of International Harvester trucks ranges from 4,200 to 33,000 lb gross vehicle weight. Wheelbase length ranges from 137 in. to 185 in., and the units come with all types of bodies.

Six-cylinder gasoline engines are standard and range from 113 to 154 hp; three more powerful V-8 gasoline engines are optional. Four of the six-cylinder engines are available with liquefied petroleum gas fuel systems. A wide range of transmissions, axles, and other components are available.

—International Harvester Co., Chicago 1, Ill.



Vibratory Compactor Directs Impact Vertically

Two pull-type vibratory soil compactors direct 12 tons of dynamic impact vertically only. The VE-72 weighs 5,000 lb, has an effective impact area 6 ft wide, and a 3 1/2-in. roll diameter. The VE-84 weighs 6,000 lb and has a 7-ft wide impact area. Vibration frequency is 800 to 1,400 vpm.

A Hercules two-cylinder, 35-hp air-cooled gasoline engine powers both models. A diesel engine or hydraulic motor is optional.—Seaman-Gunnison Corp., Milwaukee 15, Wis.

Concrete Spreader Comes in Two Sizes

The Maxon Dumpcrete Concrete Spreaders introduced in 1958 are now available in two sizes. The single-lane model lays a slab 11 to 16 ft wide, and the full-width model lays a 20 to 26-ft-wide slab. Both models are adjustable in 6-in. increments within the width range. The bucket length is 12 ft for both units. The models are capable of placing 180 to 260 cu yd of concrete per hour.

The new models are designed for paving by central mixing with a non-agitated hauling method. The bucket has a 5 1/2-cu yd capacity and can be loaded from either side. All movements of the spreader are hydraulically powered and controlled by the operator from a control panel at the center of the spreader.—Maxon Construction Co., Inc., 2600 Far Hills Ave, Dayton 19, Ohio.

continued on next page



New Haulpak Trucks Have Many New Design Features

The LeTourneau-Westinghouse Haulpak truck can't break a spring because it does not have any. Instead, the "Hydrair" suspension system has four pistons that act like giant shock absorbers. There are no conventional axles, and the entire steering system is enclosed within or above the frame line, giving increased front end ground clearance. Chassis grease fittings are replaced by special bearings that are sealed at the factory and need regreasing only if disassembled.

The 27-ton and 32-ton end dump models are highly maneuverable. Wheelbase is 130 in.; diameter of the turning circle is 44½ ft. The body can be raised to 70 deg, completely dumping a full load in 15 seconds.

A Cummins 335-hp turbocharged diesel powers the 27-ton model, and a 375-hp Cummins engine powers the 32-ton unit. All models have torque converters with automatic lock-up to eliminate slip and utilize maximum engine rpm for higher speed. The trucks have four forward and two reverse speed ranges. Maximum operating speed is 35.4 mph for the 27-ton and 38.8 mph for the 32-ton model.

The standard power brakes are actually two systems operated by a single standard brake pedal. Depressing the pedal lightly engages the first stage. This is the Torqmatic retarder, an integral part of the transmission. It slows the hauler when descending grades under load. Further depression of the



pedal applies the multiple-disc air brakes in addition to the retarder. Filtered air from an independent compressor cools and cleans the brakes.

An exhaust-heated body is standard equipment for keeping wet, cold material from sticking to the body surface. Exhaust heats the body by circulating through the hollow box-section supports. Outlets are located at the extreme rear of the unit.

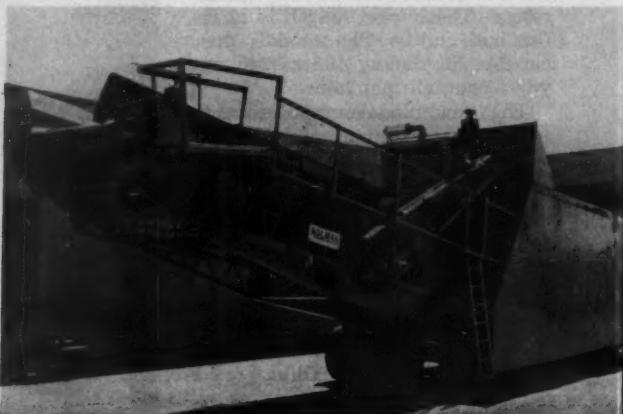
All Haulpak models have power steering. The cab has a canted windshield that angles the glass to prevent glare and distortion. Cab air conditioning is available as optional equipment.

The Haulpak line also includes an 80-ton bottom dump coal hauler designed for use in strip mining operations. The body struck capacity of this model is 100 cu yd. A 450-hp Cummins V-12 diesel powers the 80-ton unit. Maximum speed is 40 mph.—LeTourneau-Westinghouse Co., Peoria, Ill.



One Operator Controls Fast-Charging Belt Loader

The Kolman 303 mobile 60-in. belt loader loads trucks at rates up to 1 cu yd per second. One operator controls the feeder gate and a friction clutch to stop the belt between loads. A 100-hp diesel engine powers the loader. With engine, it weighs 25 tons.—Kolman Manufacturing Co., Sioux Falls, S.D.





Flatbed Trailers owned by Rego help speed heavy equipment to job site. Wherever there's a job underway around Bristol you're likely to find Rego . . . and you're sure to find Cities Service fuels and lubricants.

In Bristol:

It's Rego for Roads Cities Service for Rego!

For 25 years, the town of Bristol, Rhode Island, has called upon Rego & Sons to build and repair its roads . . . and Rego has called upon Cities Service to fuel and maintain all equipment.

"Just as we had to prove our worth to Bristol, Cities Service had to prove its worth to us," says Manuel Rego. "We started out 25 years ago with just two trucks. A couple of breakdowns could have put us out of business. But we had trouble-free maintenance then and we've had it ever since, using Cities Service products."

"Today, we've always got six or seven jobs going at one time, jobs that keep our cranes, shovels, compressors and other equipment in constant service. We've built our reputation on hard work, and we're happy to have had hard-working lubricants to help us."

If you're looking for lubricants that can do more than their share of work, give more hours between overhauls than you'd rightfully expect, talk with a Cities Service Lubrication Engineer. Call the nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



Builds Swimming Pools, Too! Rego & Sons do wide variety of jobs for Bristol and its citizens, who have the highest regard for the firm and its work. Crane pictured here uses Cities Service C-300 Motor Oil to extend periods between overhaul.



Manuel Rego expects the same quality from his lubricants that he puts into his work. Says he gets it from Cities Service. Rego always has six or seven jobs going and can't afford breakdowns or idle equipment.

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exclusive **Hollow Stem****Auger . . . lets you sample
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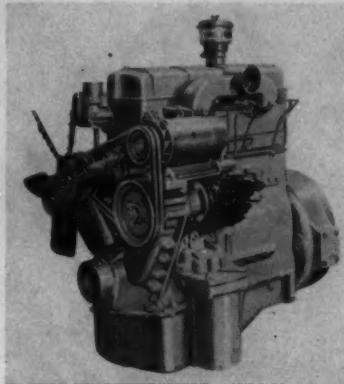
**OFF-THE-HOLE
HYDRAULIC BASE**—Rail-mounted base slides out of way while adding or withdrawing drill sections, assures continuous perfect alignment. Hydraulically operated.

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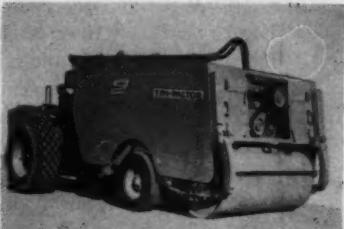
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CONTROL GROUPING**—Located on operator's side of drill base, within easy reach. Fingertip controls plus advanced safety design increases operator's efficiency.

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**NEW, EXCLUSIVE
HOLLOW STEM**
AUGERS—Actually permit all types of sampling while you bore! Augers form their own casing, also allow coring through hollow stem after rock has been reached.

**Cummins Adds Diesels**

Two new small diesels, designed for applications formerly handled almost exclusively by gasoline engines, have been introduced by Cummins. The new power plants are the 70-hp J-70 and the 80-hp J-80. They are four-cylinder, four-cycle, naturally aspirated models with 4 1/8 in. by 5-in. bores and strokes and 267 cu in. of displacement. The J-80 develops its rated horsepower at 2,500 rpm and the J-70 accomplishes its rating at 2,000 rpm. Each new engine has five 3 1/8-in. main bearings, 2 1/2-in. dia connecting rod journals, 1 1/2-in. dia piston pins, and five camshaft bearings. Both feature easily removable wet-type cylinders liners.—Cummins Engine Co., Inc., Columbus, Ind.

**Compacts Three Ways**

The new Tri-Pactor announced by Seaman-Gunnison offers a combination of pneumatic compaction, steel-wheel rolling, and a heavy-impact vibratory compaction, all in one self-propelled machine. The rig can apply 12 tons pressure on its steel roll. The prime mover, with either diesel or gasoline engine, can also be used with the company's Duo-Pactor (CM&E, June, '58, p. 150) and with its 6-cu yd scraper. The Tri-Pactor weighs 7 tons empty and 19 tons fully ballasted. Man-

ufacturer states that fast, multi-compaction combined in one machine produces densities of 100% or more, with savings of more than 50% in equipment and operation costs. Powered by a 20-hp hydraulic motor, the vibrator element permits quality compaction of plastic and elastic types of soil materials usually regarded as unsuited to vibratory compaction, the maker states. Each of the rig's eight tires give pressures up to 100 psi. Steel roll is 72 in. wide, has a 31 in. diameter. The Tri-Pactor makes 180-deg turns within an 18-ft roadway.—Seaman-Gunnison Corp., 2763 So. 27th St., Milwaukee 15, Wis.



Motor Repair Tool

A new air hammer, designed for electric motor repair work, strips copper wire from a stator quickly and easily. The manufacturer says the hammer also can be used for speedy wedge driving, for bolt cutting, and other repair jobs on motors ranging from 1/8 hp to 50 hp.

The hammer delivers up to 2,200 blows per minute, but the operator can reduce speed to any level with a touch of the finger. The air hammer uses 11 cfm at 90 psi and has a safety chuck that locks tool in six different positions. Length is 9½ in.; weight is 4 lb.

The air hammer comes in a kit that includes two offset flat chisels, a star drill, and a spoon-face chisel.—**Superior Pneumatic & Mfg., Inc., 4758 Warner Rd., Cleveland 25, Ohio.**

Large Concrete Vibrator

A concrete vibrator, designed for big jobs where pours are deep and aggregates large, operates under full load at 10,800 rpm at 183 cycles. The motor in the new vibrator has a normal output of 1,920 watts. The manufacturer says the

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multi-purpose drill*



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CORE DRILLS TO 500 FEET

BORES HOLES UP TO 24" IN DIAMETER

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- Hollow spindle drive features exclusive Mobile chuck for quick connection of drill stem. To change from core to auger drilling, merely remove drill stem, attach universal drive coupling and insert auger sections.
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- Drill is easy to dismount so that vehicle need not be tied up permanently as a drill carrier.

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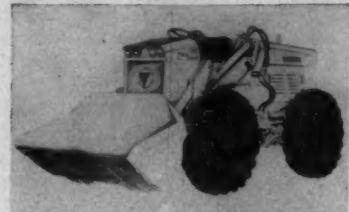
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EQUIPMENT NEWS ... continued

unit exceeds specifications for both frequency and amplitude in heavy aggregate, low-slump concrete.

The vibrator, called the DHC-300 "Texan," weighs 43½ lb and is 21 in. long. Diameter is 4 in. It operates on 180-cycle current and is available in 115 or 230-volt models.

A 3-kw generator can power a single vibrator, and several can be ganged and powered by a larger generator for big jobs. All switches and connections are waterproofed. Bearings are grease sealed. Handles that clamp on handling hose are optional.—Dart Manufacturing & Sales Co., Denver, Colo.



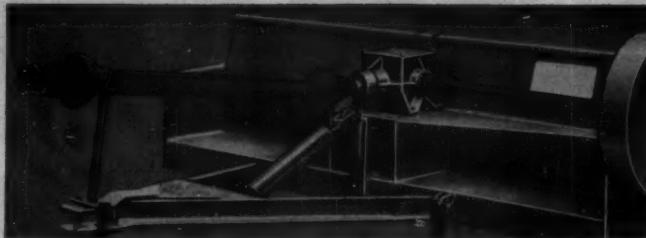
Front-End Loader

The new TractoLoader has a carry capacity of 5,300 lb, a maximum lifting capacity of 11,000 lb, and breakout force of up to 17,800 lb. Available for the TL-14 Loader are six buckets ranging in size from 1 to 3 cu yd.

The buckets have wrap-around cutting edges, and they tip back 42 deg at ground level for fast loading. The buckets can be tipped back at an angle of 47 deg when 14 in. above the ground for maximum stability in travel.

Maximum dumping clearance under the hinge pin is 10 ft 5 in. Depending on the bucket used, dumping clearance under the bucket cutting edge ranges from 8 ft 3 in. to 8 ft 5½ in. At maximum dumping height, reach from the front of the tires to the cutting edge varies from 2 ft 11 in. to 3 ft 7 in. From the front of the frame, the reach is 2½ in. greater.

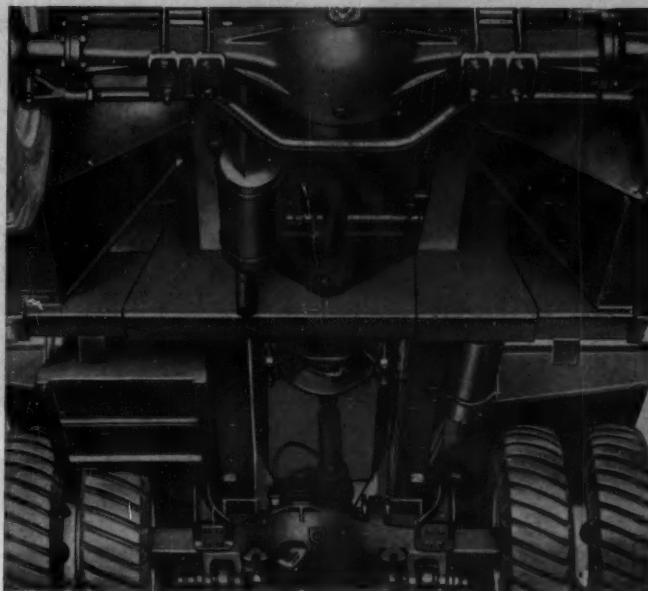
The TractoLoader can be powered by either an 86-hp, six-cylinder Allis-Chalmers gasoline engine or by an 81.5-hp Allis-Chalmers diesel engine. The unit has a three-speed full power shift transmission, travels in either direction up to 26 mph, and has a 3.5 to 1 torque converter. One lever controls all speeds, both forward and reverse.



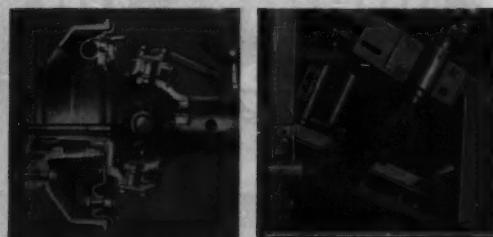
Shielded Farm Implement Drive, Tractor P.T.O. to Gear Box



Differential to Drive Sprocket, Straddle Truck



Mobile Crane, All-Wheel Drive Propeller Shafts



Jointed Front-Driving Axle High Angle, Double Joints



Road Grader, Detachable Belt Conveyor Drive



Jointed Screw Conveyor Tractor Steering Assembly



Transmission P.T.O. Drives Pump and Gear Box

POWER TRANSMISSION PROBLEMS SOLVED with Blood Brothers U-Joints

Rockwell-Standard engineers see—and help solve—a tremendous variety of problems involving a need for universal joints. Applications range from manual steering assemblies...to power take-off drives...to heavy duty propeller shafts.

To "get the power through," Blood Brothers Joints are built in the widest range of types and sizes. This range, plus application experience, can be valuable to you. Whether you want to "take power around corners"...or allow for possible minor misalignments—you can call on Rockwell-Standard engineers.

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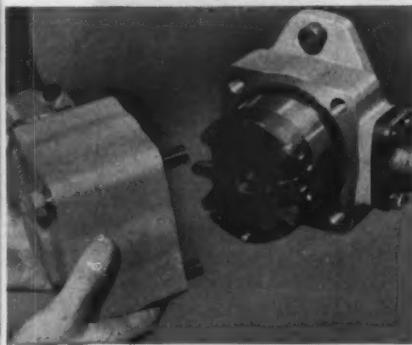
"High Performance" Pumps* keeps your jobs on schedule

*PATS. & PATS. PENDING

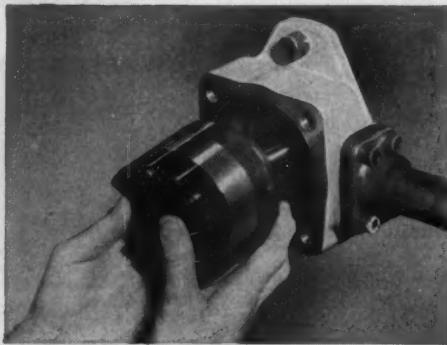


Without removing the pump from the vehicle, and without disconnecting hydraulic lines, the new Vickers "High Performance" pump can be completely overhauled by simply inserting a new pumping cartridge. The pumping cartridge contains all wearing parts in one replaceable unit and results in new pump performance. Write for Bulletin No. M5108 for performance characteristics.

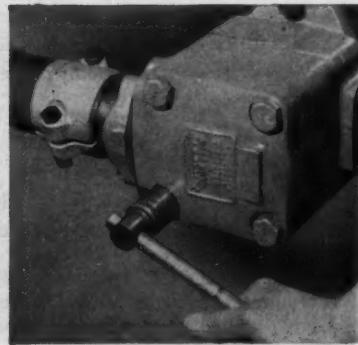
1. After safety, cleanliness and draining instructions have been followed per vehicle manufacturer's recommendations, take out four cover bolts and remove cover.
2 min



2. Take out old pump cartridge and insert new one. The cartridge includes cam ring, rotor, vanes, etc.—all parts in one assembly.
5 min



3. Replace cover and you have the equivalent of a new pump ready for long, trouble-free service.
10 min



1212

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EQUIPMENT NEWS ... continued

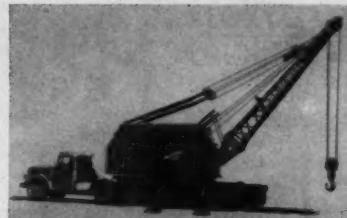
Planetary axles are pin-connected to a one-piece welded frame for greater rigidity and strength. Other standard features include a six-way adjustable, operator's seat, bucket level indicator, rear axle disconnect, and ignition-key starting on both gas and diesel models.—Tractomotive Corp., Deerfield, Ill.



Provides More Headroom

New addition to Patent's Trouble Saver line of sectional steel scaffolding is a shallow-trussed end frame that provides 6 ft of headroom. It is completely interchangeable with other Trouble Saver frames.

The new unit is 5 ft wide, 6 ft 6 in. high. It is constructed of standard size steel tubing and equipped with a sprocket riveted in each leg. The new frames can support sidewall brackets, making it possible to build another work platform the length of the scaffolding. Diagonal supports can be fixed to the frames.—Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City, N. Y.



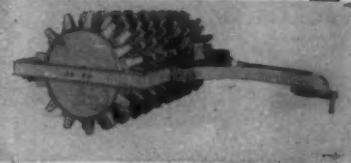
Rig Has Mobility, Power

Manitowoc's new Mobile Crane is mounted on a Talbert-built crane mount and is easily transportable over the highway. The weight of the crane is spread over five axles

Grace ASPHALT AND COMPACTION EQUIPMENT



Roadsweepers



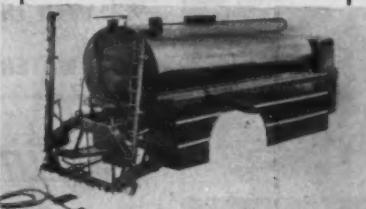
Sheepfoot rollers



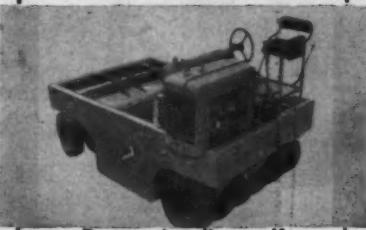
Chip spreaders



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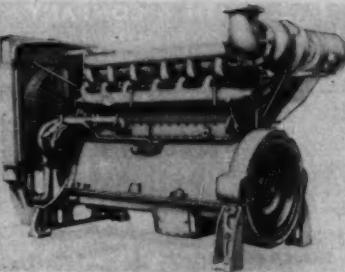
EQUIPMENT NEWS ... continued

to help meet load restrictions for highway travel. Rated capacity is 65-80 tons.

The unit's rear wheels can be powered directly by the crane engine to give added traction in muck or soft ground. When moving the rig, this linkage is locked in neutral, permitting the rear wheels to roll freely.

The 3500-TC crane has a torque converter, disc-type clutches, and an 84-in.-diameter heat-treated roller path with six rollers. The independent boom hoist is worm-gear driven and has power raising or lowering. Features on the crane mount include air brakes and outriggers.

Optional equipment for the Mobile Crane includes air controls, a third drum for pile driving and other specialized jobs, and sectional jibs that can be lengthened in 10-ft increments to a maximum of 50 ft.—Manitowoc Engineering Corp., Manitowoc, Wis.



Diesel Gets Turbocharger

Caterpillar is introducing a new turbocharged version of the naturally aspirated D342 diesel engine. The turbocharger helps the new engine develop an intermittent horsepower rating without fan of 260 bhp at 1,300 rpm.

The D342 has a four-cycle design and individually pumped, single orifice fuel injection valves, similar to other Caterpillar engines. Simplicity of operation and parts replacement, efficient burning of low-cost fuels is claimed for the engine's fuel system. The dry-type air cleaner is standard and described as capable of removing 99.8% of dust particles from air entering the D342.

When used as an electrical generating plant, the unit develops 150 kw, 187 kva, 3 phase, 60 cycles at 1,200 rpm, with available voltage ranging from 120 to 2,400. —Caterpillar Tractor Co., Peoria, Ill.

before you buy any dragline or shovel...



Here is a Model 72 equipped with a 2-yard bucket keeping nine trucks hustling on a 20-mile highway relocation job. The "Performance Proved" BAY CITY loaded over 3000 yards per day.

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Now you can see for yourself how the quality built, trouble-free, heavy-duty features of this convertible excavator can mean bigger profit for you—the BAY CITY story is in this big 16 page catalog. Write for it today and be ready for those big jobs ahead.



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Now BAY CITY offers a new low-cost 3 3/4% financing plan that makes it easy to put the "Performance Proved" BAY CITY equipment to work for you. Monthly payments up to 3 years on crawler machines . . . 5 years on rubber tire mounted machines. See your BAY CITY dealer, or write for details . . . today.



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282



FAILING BLASTMASTER drilling blast holes at iron mine near Gilbert, Minnesota. Driller: Archie Larsen. Helper: Ray Rychart.

BLAST IT... with the BIG "F"

- * in the quarry
- * at the mine
- * on construction jobs



MAST	Electric welded tubular steel construction with rigid structural sections. Heavy crown block with two roller bearing sheaves angled to align over hole and hoisting drums. Clearance above rotary table, 31½ feet to handle 20-foot drill pipe for conventional drilling or 15 to 20-foot drill collars for use with down-the-hole tools. Hydraulically raised and lowered by one large double acting cylinder with safety check. Longer mast available.
DRAW WORKS	Two drums. Spiral bevel gear drive, oil bath lubricated. Each drum equipped with 14" two-plate friction clutch, controlled by a single lever. Sixteen inch self-energizing brake on each drum. Rated single line pull, 6400 pounds each drum. Capacity, 200 feet of ½" line each drum.
ROTARY TABLE	Opening 7½". Spiral bevel gears. Oil bath lubricated. Roller bearings. Simple, easy-to-handle kelly drive bushing. Provision made for use of block type slips. Pivoted back-up tong is mounted above table for breaking joints.
ROTARY TRANSMISSION	All helical gears, three speeds forward and one high speed reverse. Remote controlled from driller's station. Single plate 12" rotary clutch ahead of transmission. Rotary speeds range from 5 rpm to 220 rpm.
SUB-DRIVE	Quadruple roller chains in oil-tight case. Oil bath splash lubrication. Heavy duty ball bearings throughout. Unitized assembly with rotary clutch transmission and friction clutch.
AIR COMPRESSOR	Le Roi Model 100 S2, air cooled, six cylinder, reciprocating type. Rated for 600 cfm at 120 psi at 1200 rpm. Equipped with safety valve, air cleaner, unloading mechanism and surge tank.
COMPRESSOR ENGINE	GM 6031-C Diesel with hydraulic full load governors: 12-volt, 120-watt electrical system; clutch power take-off and cold weather starting kit.
CONTROLS	Carefully engineered design results in fewer controls and greatly simplified operation. All drilling controls are conveniently grouped at the driller's station, including the safety master clutch and the engine starter switch. Compact design, 2" opening, matched ball bearings, oil bath lubrication. Heavy trunnions provided for pulldown yoke.
SWIVEL	Cast steel, split type, with removable swivel trunnion bushings and renewable heat-treated shoes for pulldown guide rods.
YOKES	FAILING, patented, round, three-fluted, 4¾" in diameter. Furnished in 23-foot length.
FRAME	All steel, electrically welded, with rod rack on right side and tool box conveniently located near driller's station.
WEIGHT	Approximate total weight of completely equipped drill with 31½ foot mast on Crane Carrier truck, 39,900 pounds.
MOUNTING	Truck or crawler optional.



GEORGE E. *Failing*® COMPANY
A SUBSIDIARY OF WESTINGHOUSE AIR BRAKE COMPANY
ENID, OKLAHOMA, U. S. A.



Roller for Graders

Available now for Caterpillar Motor Graders Nos. 12 and 112 is a new roller attachment that can be hydraulically raised and lowered for compacting work. Called the GraderrolleR, this attachment is made by the Martin Co. but will be available from Cat dealers.

The unit weighs approximately 2,000 lb and exerts up to 225 lb of compaction pressure per linear inch over its 42-in. roll width. The roller is equipped with spring-tensioned scraper blades and a 35-gal sprinkling system to keep asphalt from sticking to the roller. The sprinkling system goes to work automatically as soon as the roller hits the ground.

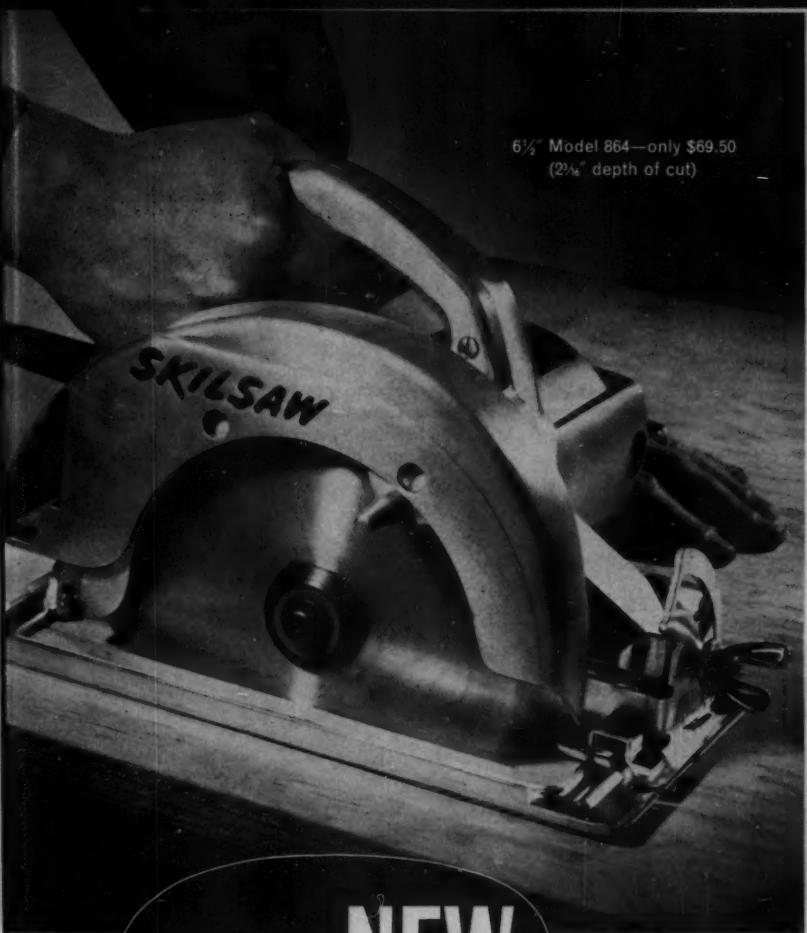
The rig's hydraulic system has an accumulator that cushions shock to the roller. All operating adjustments can be made from the operator's platform. The roll is center-pivoted and follows the slope in the road, regardless of the position of the motor grader.—Martin Co., Kewanee, Ill.



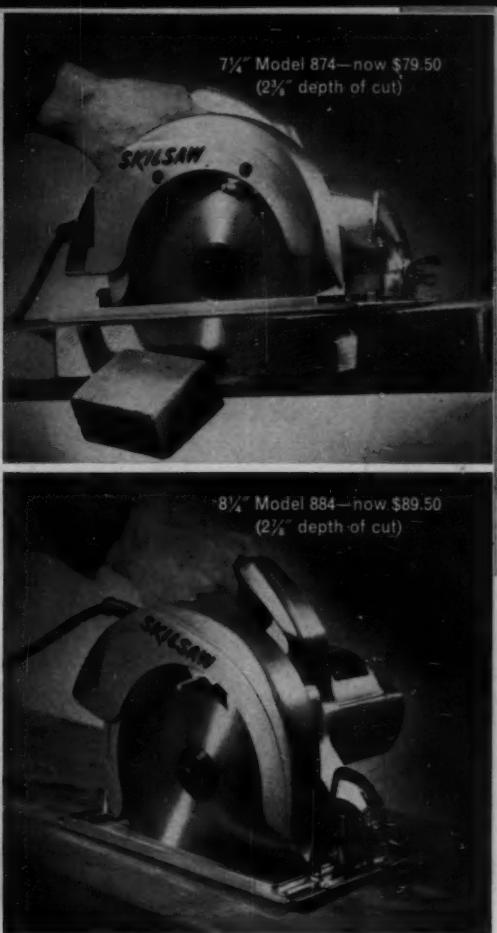
Custom-Made Lube Vans

A compact lubrication van with its own air compressor and generator is custom-built to meet the specialized requirements of individual contractors.

Details of each van are worked out to fit the purchaser's special requirements. Then the manufacturer submits drawings of the proposed lube van to the contrac-



6 1/2" Model 864—only \$69.50
(2 1/4" depth of cut)



7 1/4" Model 874—now \$79.50
(2 1/2" depth of cut)

8 1/4" Model 884—now \$89.50
(2 1/2" depth of cut)

NEW
3

SKILSAW POWER SAWS

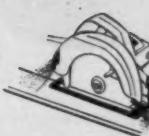
*...and new lower
prices on 7 1/4" and 8 1/4" models!*

These new ball-bearing heavy-duty models are a perfect complement to the "Standard" of the industry—SKIL's Super-Duty Line. They're the ideal "extra" saws you need to cut down non-productive time and speed up construction. Best of all, prices are low enough to meet everyone's budget.

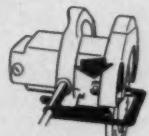
Just look at these exclusives . . . a new saw dust ejection system that directs dust away from the operator's face and line of cut. New "push but-

ton" blade lock for faster, easier blade changes . . . redesigned upper guard that permits full blade visibility . . . new easy-to-reach depth adjustment . . . many others. And each has the famous SKIL "Vari-Torque" clutch for protection against kick-back and overloading of motor and bearings.

Now available from your SKIL Distributor. Call or see him today—ask for a demonstration—of course there's no obligation.



EXCLUSIVE!
New ejection system
directs dust away from
operator and line of
cut.



EXCLUSIVE!
New Push-button en-
gages, locks saw shaft
permitting fast, easy
blade changes.



NEW!
Blade visibility is
greatly improved,
gives extra accuracy
needed on critical
cuts.



...another basic Skil construction tool

Famous SKIL and SKILSAW products made only by SKIL Corp., 5033 Elston Ave., Chicago 30, Ill. In Canada: 3601 Dundas St. West, Toronto 9, Ontario.



PARADE OF PROGRESS

To set new production records . . . t

More Power

With a 360 horsepower turbocharged engine . . . the GM 6-110T . . . for ample power no matter what the loading conditions, grades, or traction. Also available are the 335-hp GM 6-110 and the Cummins NRTO-6-BI engines.



PLUS all these profit-proven LW "standards"

Fast-loading 28-yd *Fullpak*® scraper design, for better "boil", fewer voids, more pay-yards per load; *Power-Transfer differential*, to keep your machines working in softest going; *Electric controls*, fast-acting, easiest-

to-operate, easiest of all control systems to maintain; *Positive-powered kingpin-steer*, for fast, easy maneuvering in tight quarters; *Interchangeability*, of scraper with Rear-Dumps, for top use of equipment dollars.

... the New B Tournapull® now offers you

A New Transmission

Pressure-lubricated Fuller L-1550, developed especially for the 360-hp "B". A heavy-duty transmission with power-shift range box providing 10 forward speeds (to 30.2 mph), and 2 reverse. For torque-converter action, choose the "B" with Allison Torqmatic transmission. 335-hp "B" available with either Allison Torqmatic or L-1520 step-gear transmission.

Greater Strength

With new "ruggedness" improvements, including widespread use of high-tensile strength steel at all critical wear and stress points. Result of these improvements is the longest-lasting, steadiest-working 'Pull*' ever built.



Watch LW in '59!

This announcement of the new B Tournapull follows, by only a few weeks, the unveiling of the new LW line of "full-sweep visibility" motor graders. Both developments are part of the LeTourneau-Westinghouse Parade of Progress ... a program of design, engineering, and manufacturing

know-how that is giving you the biggest-producing, lowest-cost-to-operate earth-moving machines in history.

Join the parade! . . . Ask your LW Distributor for full details. Tell him you'd like to see a demonstration.

*Trademark BP-2133-DC-2



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

How to handle WET JOBS

#47 of a series

Project:

**Power Plant,
Managua,
Nicaragua**

Contractor:

**The
H. K. Ferguson
Company, Inc.**

**Pumping
Contractor:**

**Wellpoint
Dewatering
Corp.**



IN NICARAGUA'S VOLCANIC soil, a Griffin wellpoint system lowers 32 ft of water. Excavated material is used to build a dike (see photo) which protects work area from Lake Managua's waves. No sheeting needed here — excavation open-cut.

GRIFFIN WELLPOINT CORP.



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**Get up to one extra
man-hour
a day**



Model "J" - 10 ton
only \$1250.00*

with **MILLER** Tilt-Top's
drive-on, drive-off loading!

Rigs moved three times or more a day means that men and equipment are occupied with getting the rig on or off a trailer six times!

With MILLER Tilt-Top's ONE man, TWO minute loading you save from five to ten minutes each time over the slower loading more awkward trailer types. Cutting non-productive between-job-time . . . boosts time on the job for man and rig every day . . . or as much as ten to twenty hours a month! And look at the features . . . you pay no premium for quality . . . just call and ask your distributor!

Miller®
Tilt-Top Trailer Inc.

457-U S. 92nd Street, Milwaukee 14, Wis.

*F.O.B. Milwaukee, Wis.
Complete with platform and tires. Brakes and optional equipment extra.

*Plus 10% Federal Tax



TIMKEN ROLLER BEARINGS
used on axle assemblies for long life at road speeds



10" DEEP SIDE CHANNELS
provide rigid support right out to the edges for wide trail rigs.



HYDRAULIC TILT CONTROL
(Optional) Cushions tilt action—lowers like a feather



HEAVY DUTY BRAKES
(Optional) Available in air, vacuum, or electric types.

EQUIPMENT NEWS . . . continued

tor. Each unit is factory-tested before delivery.

Standard equipment includes heavy-duty pumps and reels, storage space for filters and other replacement parts, and flood lights for night work. The vans are fully enclosed to protect lubricants from weather and contamination. An air hoist with trolley simplifies loading. — **Aro Equipment Corp., Bryan, Ohio.**



Larger Circle on Grader

One of several new features on LeTourneau-Westinghouse motor graders is a larger circle. Now 63 in.—9 in. more than the older model had—the bigger circle provides more blade stability, permitting the operator to do a more efficient job of finish grading. Wide-spaced circle legs on the graders assure stable blade control and provide "chatter-free" operation. Teeth on the circle are replaceable.

Other recent changes in the seven LW-Adams graders include improved moldboard tilt adjustment, increased visibility for the operator, enclosed ball-socket lift link caps. A new six-cylinder engine is available for three of the models.

The new moldboard tilt adjustment is a time saver. Only one nut has to be loosened on each circle leg. The job can be done in the field in as little as 15 minutes.

Visibility of the operator is said to be about 10 to 15 ft closer to the front of the machines. The lift housing box-beam support, formerly on top of the frame, is now welded through the frame and opens up the top completely. In addition to improving visibility, the new position of the box-beam increases grader-frame strength because the unit is now an integral part of the frame.

Lift arms and lift links now have enclosed ball-socket caps instead of the open type. The results, according to the manufac-



on Interstate Route 94. Wisconsin

Prosper Kluck's 27.4-mph Adams 660 POWER-Flow maintains 5,000' of haul road on Interstate Highway job near Menomonie, Wis. This 190-hp grader smoothed and leveled ridges, filled in ruts, cut drainage ditches... kept haul roads in high-speed all-weather condition.



The better the haul road... the bigger your yardage!

Here's how Prosper Kluck used one big LW POWER-FLOW® 660 grader to level network of mile-long haul roads on Wisconsin job

On any of today's big-volume Interstate Highway jobs, you're likely to run into the same problem Prosper Kluck of Stevens Point, Wis., did on the building of 2.5 mi of route 94 near Menomonie, Wis. With 800,000 cu yd of sand and sand-rock to move, Kluck naturally chose big, heavy, high-production scrapers... 8 of them. But scrapers this size knock the "speed" out of a haul road in a hurry, and with haul distances of up to 5,000', Kluck needed something special in the way of road-maintenance equipment.

His choice: an LW Adams* POWER-Flow Model 660 grader. And this choice was a good one! Not only did the 190-hp machine keep Kluck's network of haul routes in top speed condition, it also maintained the fill... where the fast-hauling scrapers dumped approximately 500 yards of material per hour!

"Doesn't give us
much downtime"

"That torque-converter '660' is a dandy," says Kluck. "It's big and

heavy, and doesn't give us much downtime." The job superintendent adds, "The '660' really gets in there and digs when the going is tough. What's more, this big grader can lay down a mighty fine grade."

Let us demonstrate a LeTourneau-Westinghouse Adams Model 660 POWER-Flow grader on your job. See how it can speed up production haulers and grader work. Ask us anytime. No obligation.

*Trademark G-2060-DCJ-1

This B Tournopull® with 28-yd Fullpak® is one of 3 used by Prosper Kluck on the Interstate Highway job. Fullpak loads fast, as bowl is angled at only 1° when loading... lets this tough-loading sand flow in almost horizontally.



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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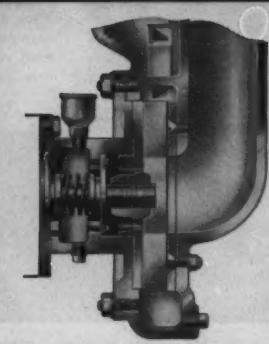
Where quality is a habit

ESSICK

SELF-PRIMING PUMPS



30 M PUMP



ESSICK DUAL SEAL



ESSICK NO-CLOG IMPELLER

**CONTRACTORS SAY:
"IT'S THE SEAL AND
THE IMPELLER THAT
MAKE THE PUMP"**

ESSICK AUTOMATIC DUAL SEAL*

The Dual Seal... field tested on thousands of operating pumps, is now recognized by large pump users as the most outstanding contribution to pump design.

*Seal failure can be the difference between profit and loss on your project... Essick pumps, with the Automatic Dual Seal, ensure 24 hour per day dependable pumping.

ESSICK NO-CLOG TRASH HANDLING IMPELLER**

Specially designed open-vane, balanced impellers, guaranteed to pass spherical solids equal to 25% of inlet diameter, are featured in Essick Pumps. The impeller eye is of ample diameter to pass material which easily clears through the extra wide vane passage ways.

**Trouble-free operation with no-clog assurance and self-cleaning action, is automatic in all Essick Self-Priming Pumps.

A COMPLETE LINE OF CONTRACTORS PUMPS FROM 4,000 GPH TO 240,000 GPH INCLUDING DIAPHRAGM PUMPS, HIGH-HEAD PUMPS, AND BELT DRIVE OR DIRECT CONNECTED PUMPS FOR ELECTRIC MOTOR OR GASOLINE ENGINE DRIVE.

SEE YOUR ESSICK PUMP DEALER FOR A DEMONSTRATION

ESSICK MANUFACTURING COMPANY

1950 Santa Fe Avenue
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Elizabeth, New Jersey

Affiliated with THE T. L. SMITH CO., Milwaukee, Wisconsin

turer, are cleaner operation and more complete lubrication.

The new six-cylinder, four-cycle Cummins C-160-BI engine is available for the 440, 550 and POWER-Flow 55 models. These power plants range from 115 to 145 hp. Choice of the GM 4-71 two-cycle engine is also available on these models. All engines are rubber-mounted.

The graders' constant mesh transmission offers eight forward, four reverse, and three operational creeper gears. Another feature is a double-acting hydraulic braking system. Torque converters are available in the big 660 and 550 models. The seven rigs permit a choice of power from 60 to 190 hp.—LeTourneau-Westinghouse Co., 2301 NE Adams St., Peoria, Ill.



Works in Tight Quarters

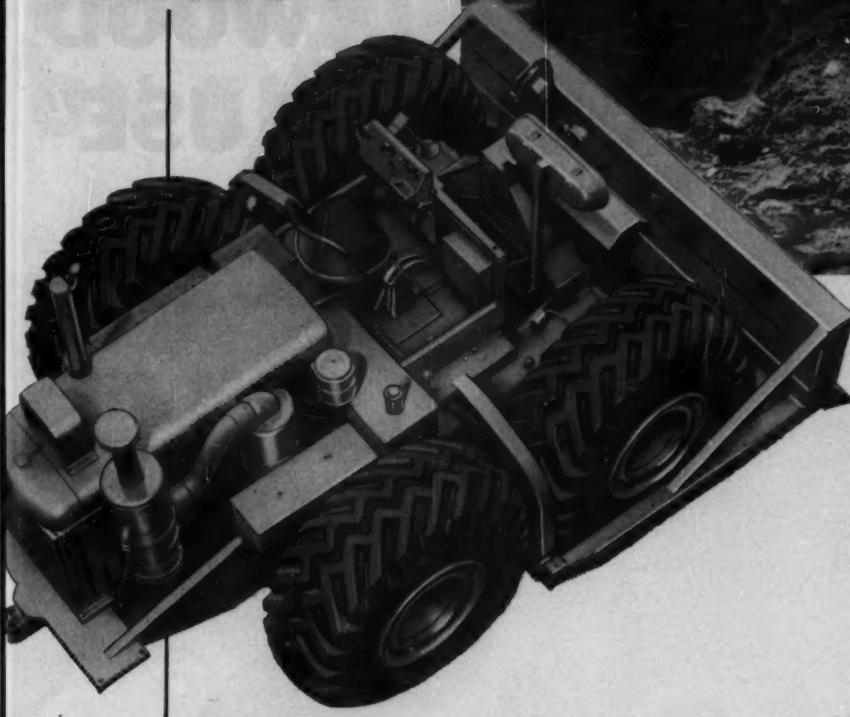
A new powered buggy, rated at $\frac{1}{2}$ tons, is $31\frac{1}{2}$ in. wide—small enough to go through doorways and spot its load in confined areas. It is powered by a 7-hp, air-cooled Wisconsin engine.

The combination transmission, differential, and drive-axle assembly is fully enclosed and lubricated from one oil reservoir. The transmission is full torque shifting, constant mesh, with instant shift from forward to reverse.

The model 15-B Prime-Mover's 10-cu-ft dump bucket latches onto the chassis. The bucket can be interchanged quickly with a flatbed platform, adapting the rig for hauling a variety of materials.—Prime-Mover Co., Muscatine, Iowa.

TRACKS?

TIRES?



which type of tractor is best?

The job is the key to your answer. You have to deal with 2 types of tractor work on every earthmoving contract: (1) concentrated pushing, dozing, and hauling in restricted areas, and (2) scattered hit-and-run work over the entire work site (or several work sites).

Q. Which does a better job on these basically different types of work: crawlers or rubber-tired tractors?

A. For necessary "stay put" jobs in limited areas, crawlers may prove best... because of their greater lug-



Heavy-duty Tournatractor — 210 hp — speeds to 17.2 mph forward, 7.2 mph reverse — power-shift constant-mesh transmission with torque converter — multiple-disc air brakes with 3,762 sq in. of braking surface — skid steer — tires: standard 21.00-25 16-ply, optional wide base 26.5-25 14-ply; choice of traction or rock service treads.

Work tool attachments — bulldozer — Angledozer® — root rake — push-block — tree stinger — power-control-unit.

Q. What does Tournatractor® offer that other rubber-tired tractors don't have?

A. The big difference is *proof of performance*. When you buy a Tournatractor, you're getting a tractor without "bugs". This 318-hp, 17-mph tractor has been used by contractors all over the world on every possible tractor job. Knowledge gained over the years has resulted in continuous improvement in mechanical efficiency and performance. It's the *only* thoroughly job-proven, rubber-tired tractor available for heavy earthmoving work.

Here are a few quick facts about the Model C Tournatractor... *Drawbar pull*: as good as comparable priced crawlers at speeds over 2 mph. *Mobility*: to go anywhere at speeds to 17 mph. *Roadability*: travels anywhere without damage to concrete, blacktop, planking, or rail ties. *Quick speed shift*: saves time making speed changes on the run. *Easy operation*: with electric control of dozer blade and other attachments. *Low maintenance*: because of far fewer parts, simple construction.

Ask for a copy of the L-W bulletin 56-061-T for full details.

CT-1977-DC-1



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Where quality is a habit

OVERLAID PL WOOD "COST PER USE"

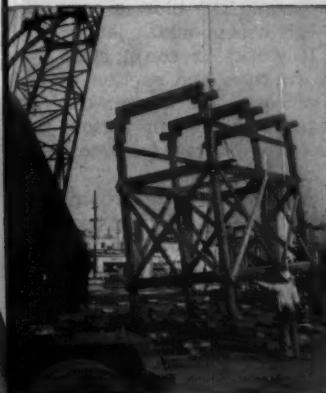


FINAL LINK: NIMITZ FREEWAY
Market to Fallon Streets
Oakland, California

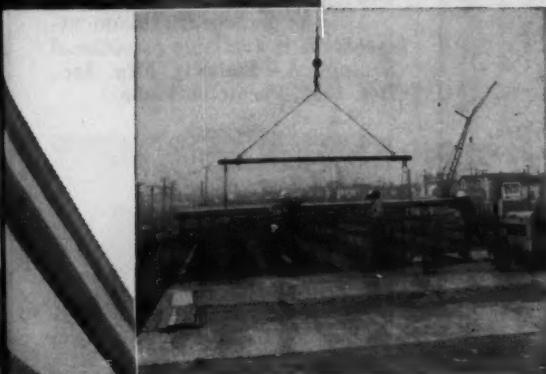
DESIGN & ENGINEERING:
Bridge Department, Division of Highways,
California Department of Public Works

CONTRACTOR:
Johnson, Drake & Piper, Inc.
Oakland, California

FORMS GIVE LOWEST ON ELEVATED HIGHWAY



In carefully planned sequence of operations, prefabricated shoring towers were positioned, screw-jacked to required height. Deck form sections were then crane lifted into position.



High density overlaid plywood concrete form panels give over 50 re-uses, cost less than .007¢ per sq. ft. of form per pour.

"THE EXTRA RE-USES we got from overlaid plywood more than offset its greater initial cost," says George Krenkel, project manager for Johnson, Drake & Piper, Inc., contractors for this 1.55-mile long 8-lane elevated highway.

"Even after giving upwards of 50 re-uses, a large percentage of the panels were salvaged for additional use on other jobs," Mr. Krenkel reports. "Besides being more economical in terms of cost per use, overlaid plywood creates much smoother concrete and is easier to strip and clean."

On the job over 50,000 sq. ft. of $\frac{5}{8}$ " overlaid plywood was used for deck slabs, columns and guard rails. Pre-built 8' x 20' and 8' x 22' deck forms were supported by ingenious prefabricated shoring towers which were leap-frogged as pouring progressed. Screw jacks were used to raise towers to required heights. Stripping was accomplished simply by lowering jacks until the forms came free.



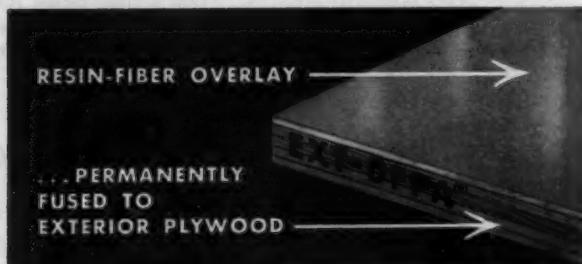
DOUGLAS FIR PLYWOOD ASSOCIATION

TACOMA 2, WASHINGTON

—a non-profit industry organization devoted to research, promotion and quality control

HIGH DENSITY OVERLAIRED FIR PLYWOOD is a premium concrete form panel intended for jobs that require ultra-smooth concrete surfaces and/or many re-uses (up to 200 re-uses may be obtained with properly designed and constructed forms). Base panel is EXT-DFPA® Exterior plywood.

Standard concrete form grades are: *Interior PlyForm®* with water-resistant glue for multiple (up to 10-12) re-uses; *Exterior PlyForm®* (waterproof glue) for up to 25 or more re-uses.



when the going gets rough— give 'em "L"

LESCHEN
Red-Strand
WIRE ROPE



When the bite is on the dragline, you'll be glad you rigged with Leschen—the wire rope that's the same top quality in every foot of every reel. The new Leschen wire mill is designed to deliver exactly that. New machines . . . new processes . . . exclusive new continuous-flow technique—all as modern as tomorrow. Try

Leschen Red-Strand Wire Rope now and see how its uniform quality makes your operation safer, your replacement time farther in the future. Make your next order Leschen! *Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.*

LESCHEN WIRE **PORTER** **ROPE DIVISION**

H.K. PORTER COMPANY, INC.

DIVISIONS: Connors Steel, Delta-Star Electric, Disston, Forge & Fittings, Leschen Wire Rope, Mouldings, National Electric, Refractories, Riverside-Alloy Metal, Thermoid, Vulcan-Kidd Steel, H. K. Porter Company (Canada) Ltd.

EQUIPMENT NEWS . . . continued



Built-In Blower on Broom

A self-propelled power broom has a built-in blower powered by a V-belt drive from the tractor's power take-off. The blower produces a full broom-width jet air stream. It works in conjunction with the rotation and suction of the broom core. The blower can be adjusted and held in various positions to compensate for broom core wear.

Another feature of the Broom-Master is Ampli-Torc Drive, producing high or low speed ranges in each of six gears—five forward and one reverse. Tractive effort in any gear speed can be boosted 90%, and ground speed decreased 48% without clutching, throttling down, or stopping.

An 8-ft moldboard blade attachment is available as optional equipment.—Flaherty Mfg. Inc., Box 1042, Pocatello, Idaho.



Cement Hauler Unloads Itself

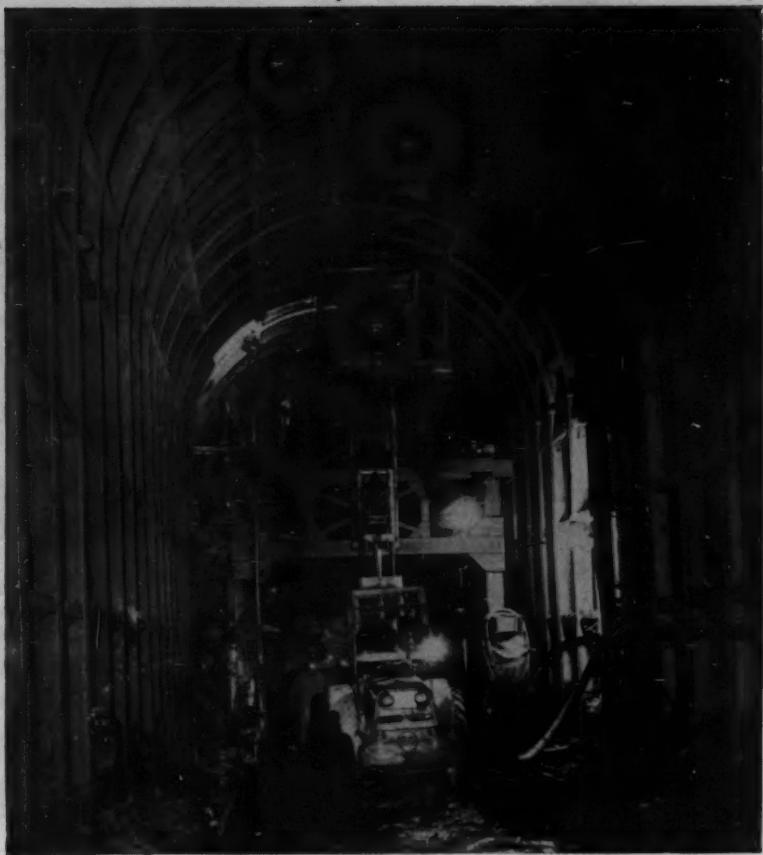
The pneumatic blower on this tank-trailer pumps cement 120 ft or more eliminating the need for a conveyor and bucket elevator.

The blower is mounted on the rear of the tank and powered by a gasoline engine. Or it may be mounted on the tractor and connected to the power take-off shaft. The blower pumps cement through a 4-in. hose at a rate of 3.33 bbl per minute. Unloading speed can be manually controlled with a valve located at the center of the trailer.

The tank has a maximum capacity of 120 bbl of cement.—Fruehauf Trailer Co., 10940 Harper, Detroit 32, Michigan.



TUNNEL WORKERS swing into position 8" H-beam side post which supports arch rib.



SETTING STEEL where "bad roof" conditions required spacing COMMERCIAL tunnel supports on 4-foot centers.

How to Support a "Bad Roof" Tunnel

The development of an important new source of metallurgical and coking coal was contingent on rail penetration of an almost inaccessible mountain valley.

To reach the 140 million ton bituminous seam in rugged Dickenson County, Virginia, the Norfolk and Western Railway laid a 6.3 mile extension to its Wilder spur. The railway penetrates Sandy Ridge Mountain 800 feet below its 2,730 foot summit with an 8,240 foot tunnel...one of the longest in the East.

Test borings, core-drilled from the top of the mountain to some 17-20 feet below the proposed tunnel floor forewarned of the "bad roof" conditions to be encountered in both headings. Varying thicknesses of unstable gray sandstones, shale, and coal would require tunnel supports designed for quick setting after each mucking operation.

Working closely with COMMERCIAL engineers, Norfolk and Western designers specified 8" steel H-beam

tunnel arch ribs, bent to proper contour and set on steel posts for the 20-foot by 27-foot bore.

Here's where COMMERCIAL's 30 year "know-how" paid extra dividends in safety and speed of job completion. Almost as soon as both headings were started, thin laminated sandstone and coal seams appeared following the roof line for almost the entire length of the tunnel. Thanks, however, to COMMERCIAL's accurate fabrication and fast erection design, setting steel progressed rapidly without major mishap to workmen or headings.

A "jumbo" drilling platform was employed to actually handle the steel. One pneumatic hoist mounted on the forward poopdeck swung side posts into place while another hoist on the rear handled the arch rib segments. The sets were then tied together by 1" steel rods and separated by 4" by 4" timbers.

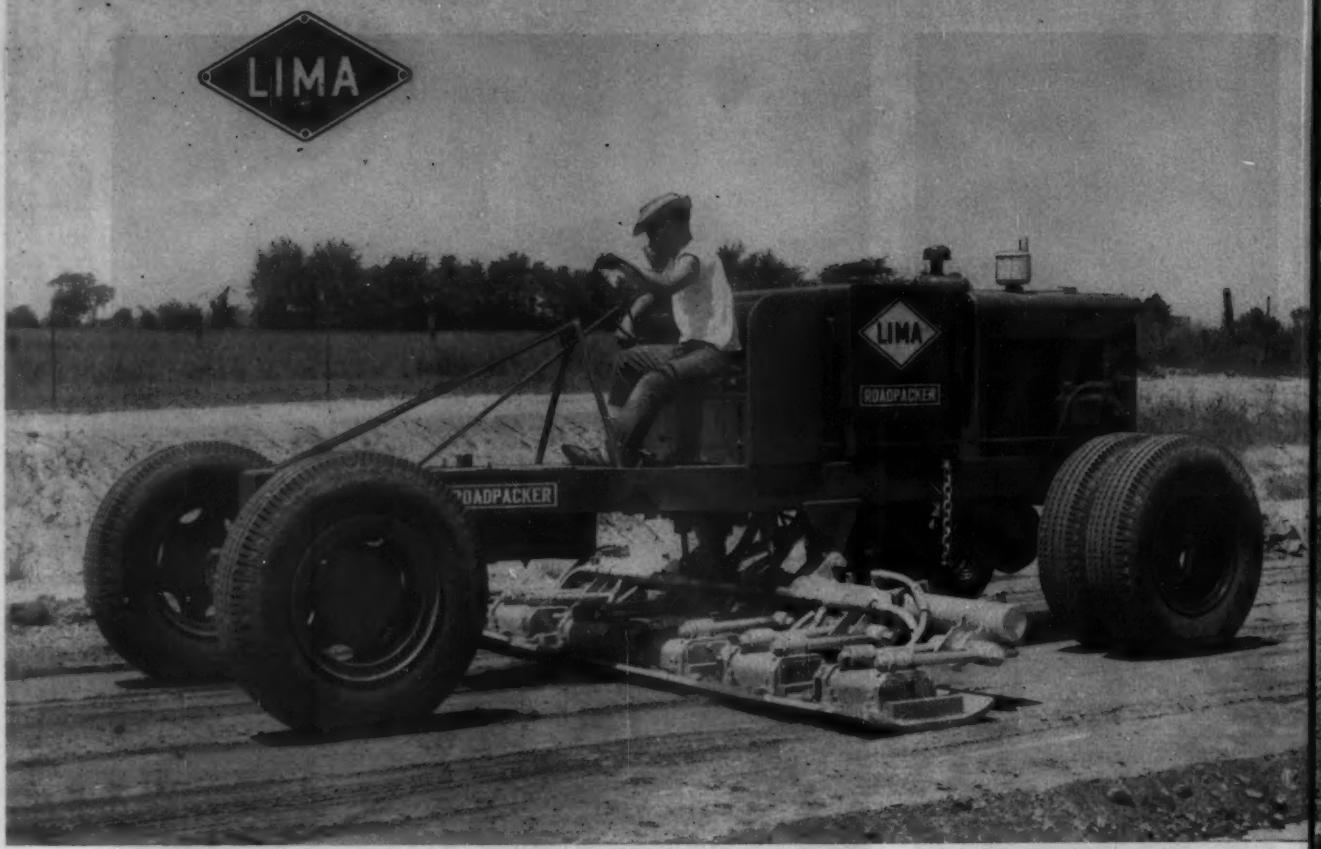
COMMERCIAL delivered posts and

arch ribs keyed to the job progress schedule, thus helping 'round-the-clock crews drive the face at an average weekly rate of 250 feet including steel setting...progress that was also important to a new local 450,000 kw powerplant dependent on the valley mines for fuel.

When you design your next vertical shaft or sub-surface tunnel, COMMERCIAL engineers will be glad to offer assistance based on 30 years specialization in ground and rock support systems. There is no obligation, and their recommendations often result in more workable and economical solutions to specific problems.

For complete information, just write to Commercial Shearing & Stamping Co., Dept. B-18 Youngstown 1, Ohio.

COMMERCIAL
shearing & stamping



LIMA Roadpacker speeds highway and airport construction across the nation

The LIMA Roadpacker is a big favorite with prominent contractors throughout the country for highway and airport construction. It has no equal for fast, uniform consolidation by the vibratory method of single course macadam bases, gravel subbases and soil-cement bases.

The Roadpacker is equipped with six 420-lb. hydraulically driven shoes for effective vibrating and tamping action. These oscillate approximately $\frac{1}{4}$ in. at the proper frequency for best consolidation of any base material. The force is applied vertically

to prevent shoving the material being consolidated. The sole plate is designed for both forward and backward operation.

Working widths—easily varied by upfolding one or both of the end shoes—range from 8 ft., 9 in., with four shoes, to 13 ft., 1 in., with six shoes. The shoes are raised and lowered hydraulically.

Get the full story on the LIMA Roadpacker today. See your nearby distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN • LIMA • HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment





Four of Merritt-Chapman & Scott's seven 6-yd. Lima Type 2400 Shovels are shown working on the excavation site of the Niagara Power Project's main generating plant at Lewiston, N. Y.

Four contractors use 17 Limas on giant Niagara Power Project

Wherever there is a really tough job to be done—when high production, dependable heavy-duty service, rugged power, and low operating cost are essential—you are almost certain to find powerful Limas chosen for the task.

The \$720,000,000 Niagara Power Project is a big job—one of the biggest. Four of the project's contractors are using a total of 17 high-output Limas on their jobs! The duty roster includes 11 big 2400's which can be used interchangeably as 6-yd. shovels, variable capacity draglines and cranes; one Type 802 50-ton crane; two 4-yd. Type 1601 shovels; one Type 1201 which can be used as a 3½-yd. shovel or 70-

ton crane; and two 35-ton 54-T truck cranes.

Around the world, profit-minded contractors know from experience that it pays to buy Limas. They are quality-built throughout to deliver high production at low operating and maintenance costs.

Quality Lima Features

Here are a few examples of the superior features found in the Lima Type 2400—extra strong and rigid rotating base supported by oversize conical rollers in conjunction with double flanged heat-treated roller path and separate hook rollers; horizontal gear

train and swing bevel gears are pump-lubricated in oil-tight case; anti-friction bearings are used throughout. Induction hardening of all wearing parts increases life. Crawler bushings are equipped with piston-ring type oil seals. Torque converter adjusts load speed to correspond with the resistance to moving the load—no engine stall.

Limas For Every Job

Profit with Limas—there is a type and size for every job—½ to 6-cu. yd. shovels, cranes to 110 tons crawler-mounted, 70 tons on rubber, variable capacity draglines. Investigate now! Contact your nearby Lima distributor or write us for full details.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN • LIMA • HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment





Lima Austin-Western portable 101-SE Crushing and Screening Plant processes gravel and rock fed into its mechanical feeder in 1-cu.-yd. bites by Lima Type 44 Shovel. Accurately sized gravel travels conveyor direct to waiting State Highway truck at this Buchanan, Mich., site.

Crusher output averages 1000 cu. yd. daily— Lima Austin-Western 101-SE owner pleased

Roadbuilder John G. Yerington, of Benton Harbor, Mich., owns five Lima Austin-Western Crushing and Screening Plants. Of his portable 101-SE, shown above, Mr. Yerington says, "It is about 4 years old, but maintenance costs are extremely low. I'm well pleased with its ability to average over 1000 cu. yd. daily at a low cost per ton."

Superior performance

Thirty-one years ago, he bought his first Austin-Western equipment. Now he owns five Lima Austin-Western Crushing Plants and a Lima Type 44 Shovel. In addition, he has three graders, five rollers and a hydraulic crane—all Austin-Westerns. Obviously Mr. Yerington has learned from experience the superior capabilities of B-L-H equipment.

The rugged 101-SE is a completely portable, self-contained unit designed and built for rapid transport from job to job. High-speed production of construction materials at end-use sites reduces haulage time and costs. Diesel engine operates crushers and electric generator, which powers all other operations. Simplicity of transmission eliminates troublesome clutches, chains, sprockets and gearboxes . . . reduces maintenance, lowers tonnage costs. Only one man is required to operate the 101-SE by push button.

More tonnage for less

Lima Austin-Western Crushing and Screening Plants are engineered and quality built to produce a high volume of accurately sized gravel or rock over long years of trouble-free service. There is a portable or stationary Lima

Austin-Western Crushing and Screening Plant exactly right for your needs. Learn how you can step up production and lower tonnage costs. See your nearest distributor or write us today!



Crawler-mounted Lima Type 44 Shovel empties its 1-cu.-yd. load into automatic feeder of Lima Austin-Western 101-SE Crushing and Screening Plant.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment
BALDWIN • LIMA • HAMILTON
CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

5929





*Easy
to set up
and a
honey to
operate*



We like the portability and quick-erection features... the fast-mixing action

and the clean operation of our Madsen Asphalt Plant — says Gene Ballard, Vice President,

East Coast Asphalt Corporation, Fort Lauderdale, Florida

MADSEN ASPHALT PLANTS

Built in sizes of 1000-lbs.
to 6000-lbs. batch capacity

The big MADSEN 5000-lb. Model 481 batch capacity asphalt plant shown above is owned and operated by East Coast Asphalt Corporation of Fort Lauderdale, Florida. It has a 50-ton 4-compartment hot bin, and 84" x 36' Madsen Dryer, a Madsen 12' diam. Cyclone Dust Collector and a Madsen Triple Wet Tube Dust Washer.

This plant is capable of producing up to 200 T.P.H. on a 45 second charge-mix-discharge cycle.

FOR YOUR CONVENIENCE — MADSEN MAINTAINS A COMPLETE PARTS STOCK IN LOS ANGELES AND LIMA, OHIO

Owners of MADSEN Asphalt Plants may not agree on which MADSEN feature is most outstanding, but, they all agree that MADSEN gives them the right combination of advanced engineering features for a more profitable asphalt plant operation. The MADSEN Model 481 Asphalt Plant, for example, offers more than 25 big features and advantages that increase production, reduce maintenance, and save countless dollars in plant operation.

Some of these features are shown below. See your MADSEN Distributor for the complete story.



FEWER SEPARATE PARTS MEAN FASTER ERECTION — Complete hex-like unit sections are built for transport on the highways. All major components may be wheel-equipped at the factory or in the field.



FAST, PRECISION TIMING AND WEIGHING — MADSEN Twin-Shaft PUG MILL MIXERS — Combined with Madson Asphalt Pressure Injection System (Patented) to provide the fastest and most thorough mixing action known to the industry.



ROLL-AWAY WEIGH-BOX — Exposes mixer for fast, easy servicing of mixer tips and shanks.

CLEANESEST OPERATION — Madson Asphalt Plants meet air pollution requirements everywhere. Tests prove Madson Triple Wet Tube Dust Washers are 99.7% efficient!

STAY MODERN WITH MADSEN

Ask your MADSEN Distributor for Catalog No. 800-A or write MADSEN WORKS, P.O. Box 38, La Mirada, California or Baldwin-Lima-Hamilton Corporation, Lima, Ohio



Equipment that Serves.

MADSEN WORKS

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CONSTRUCTION EQUIPMENT DIVISION



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FEED TUNNELS • ASPHALT TANKS • ASPHALT AND FUEL PUMP UNITS • CONCRETE FLOAT FINISHING MACHINES FOR AIRPORTS AND HIGHWAYS • ROYAL CROWN PUMP VALVES

AUSTIN-WESTERN ANNOUNCES THE PACER!

A COMPLETELY NEW SERIES OF 4-WHEEL GRADERS

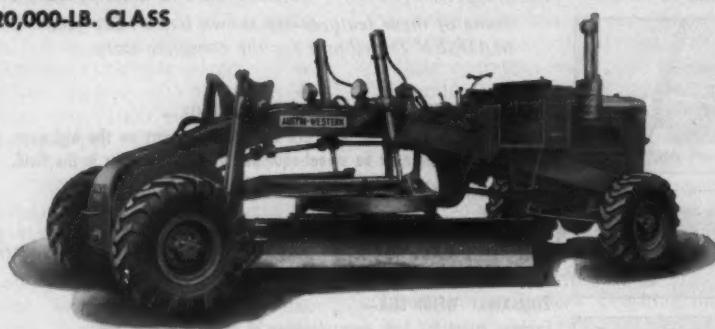
3 models offer added power, weight . . . new design, construction features; deliver superior speed, maneuverability.



PACER 100
16,000-LB. CLASS



PACER 200
20,000-LB. CLASS



PACER 300
21,000-LB. CLASS

See the all new Pacer models at your Austin-Western distributor's now. Ask for full information on the expanded line of advanced design 4 and 6-wheel graders!

Austin 100th YEAR PARTNERS IN PROGRESS SINCE 1885 **Western**
CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.
BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes



EQUIPMENT NEWS . . . continued



Rolling Concrete Tamper

The rolling action of the new Roller-Tamper gets a smooth surface on concrete with less work. The device is suited also to working in cramped quarters. The Roller-Tamper's long handle adjusts to an offset angle, permitting a worker to roll-tamp without standing on the concrete slab. The new tool brings grout to the surface, knocks down bumps and permits tamping a second time, after the slab is bull floated.—H. S. Watson Co., Cmetco Div., Emeryville 8, Calif.



Diamond Core Drills

Core drills using whole surface-set industrial diamonds for wet drilling of reinforced concrete, masonry, stone, and blocks of all types are available in two models. The models are called "Resettable," in which unused or worn diamonds can be reclaimed; and "Throw-away," an economy version.

The core-lock drills are used with circulating water applied through a swivel. Standard drill diameters range from $\frac{1}{4}$ -in. O.D. to 14-in. O.D. But special sizes are available on order. Nominal drill length is 13 in. overall. Longer drills can be supplied.—Felker Manufacturing Co., 1128 Border Ave., Torrance, Calif.



Portable Batching Plant

A new 6-yd batching plant, with a capacity of 40 yd per hour, is mounted on four wheels for easy portability. The rig weighs approximately 6,500 lb. It is 7 ft wide and 36 ft 6 in. long.

Beam scales with over under indicator are standard equipment. Dial scales are available as optional equipment. The conveyor is 24 in. wide and has a normal discharge height of 12 ft. The belt is mounted on 4-in. triple troughing idlers with extra idlers provided at the loading point. Either gas engine or electric motor drive are offered. The hopper is fabricated of Man-Ten abrasion-resistant steel.—Aeroil Products Co., Inc., 17 Wesley St., South Hackensack, N. J.



Safety Latch for Hooks

A new safety latch for hoist hooks of $\frac{1}{4}$ to 3-ton capacities has only two parts—a clamp-on collar and a spring-loaded latch that fits the hook opening.

A stainless steel spring holds the latch in place. And a notch on the free end of the latch keeps it from shifting position. A bolt and self-locking nut hold the collar in place.

The collar is made of manganese-bronze alloy that is ductile enough to conform to the contour of any hook shank, regardless of its shape.—Harrington Co., Plymouth Meeting, Pa.

AUSTIN-WESTERN ANNOUNCES THE SUPER!

AN EXPANDED LINE OF 3 ALL-NEW 6-WHEEL GRADERS

Advanced design—improved features; heavier, more powerful . . . equipped with exclusive all-wheel drive and steer.

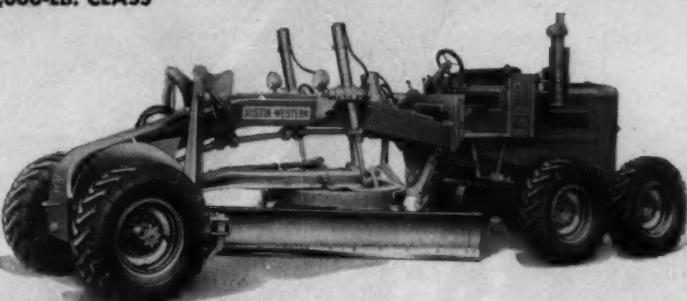
Power ranges from
106 to 120 hp



SUPER 100
18,000-LB. CLASS



SUPER 200
20,000-LB. CLASS



SUPER 300
22,850-LB. CLASS

See the completely new Super models at your Austin-Western distributor's today. Ask for full information on the expanded line of 4 and 6-wheel A-W power graders!

Austin



Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes





Tiger Brand—America's

—used on Niagara Power Project—

Niagara Falls is the greatest, single natural source of water power in North America. Soon it will be harnessed by the New York State Power Authority to produce 2,190,000 kilowatts of electricity. This is 216,000 more kilowatts than is generated at Grand Coulee Dam, the Free World's No. 1 manufacturer of hydroelectric power.

Water now tumbles over the falls at a rate of 200,000 cubic feet per second. To make use of some of this, two huge intake structures on the Niagara River above the falls will draw water into the power system. (See Map.) This water will pass

through about 22,000 feet of twin, covered concrete conduits, feeding into a huge reservoir with a storage capacity of some 20 billion gallons. From the reservoir the water will flow by gravity to an 1840-foot-long power plant built at the base of a 314-foot rock cliff on the Niagara River, below the falls. Here, 13 huge turbine-generators will turn out 1,950,000 kilowatts of electricity. An additional source of power will be the smaller pump-generator station at the reservoir, generating up to 240,000 kilowatts. Shovels and bulldozers rigged with USS Tiger Brand Wire Rope are busy



a's No. 1 Wire Rope

Project—biggest in the country

ed con-
oir with
gallons.
gravity
the base
r, below
ors will
ity. An
smaller
genera-
ldozers
are busy

chewing away the rocky cliff to make room for the power house.

Why Tiger Brand is your best buy

1. It is made by a company that maintains the most complete wire rope research and manufacturing facilities in the country.
2. It is designed by one of the country's largest staffs of wire rope engineers. It is serviced by thoroughly experienced field representatives always ready with their assistance.
3. Every type of Tiger Brand Wire Rope is designed for specific applications. You get the right rope for the job.
4. It is made by one company, U. S. Steel, and every step of production, from ore to finished product, is carefully controlled and supervised to guarantee one high standard of quality.

5. Tiger Brand Wire Rope is manufactured by the largest single producer in the country.

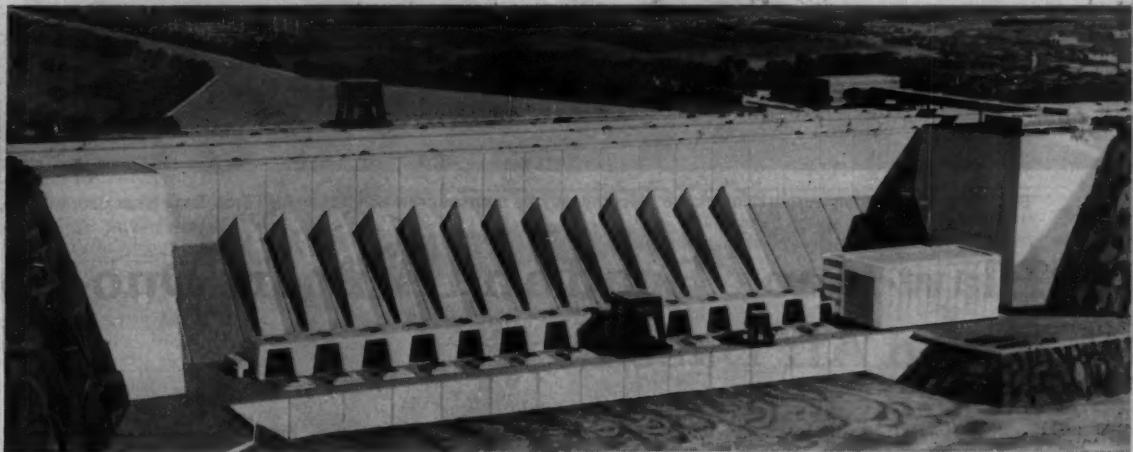
For complete information, write to American Steel & Wire, Dept. 919, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks



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United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Alabama, Southern Distributors
United States Steel Export Company, Distributors Abroad



Main generating plant of the Niagara Falls Power Project, one of the world's largest, will produce 1,950,000 kilowatts of electricity.

Ripping rock—USS Tiger Brand Wire Rope is used throughout this shovel and on many of the other draglines, cranes and bulldozers digging the excavation for the main power plant.

Engineering Consultants:
Uhl, Hall and Rich—Boston

General Contractors:

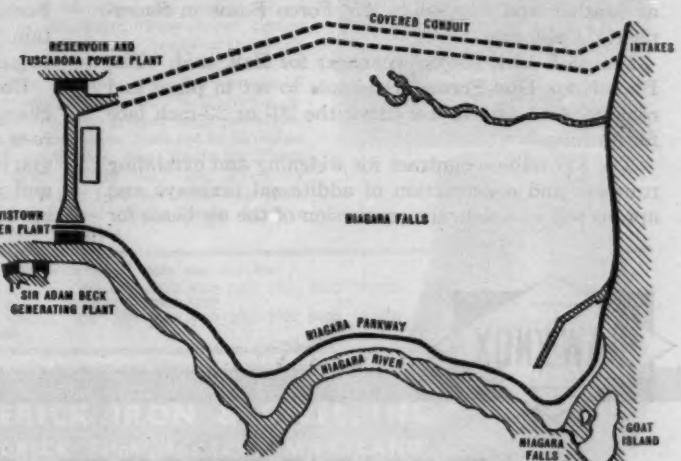
Merritt Chapman & Scott—
\$38,288,498 Niagara-Power Plant and
\$65,692,254 Niagara River Intake Works,
plus 6600-foot section of the waterway.

Balf-Savin-Winkelman—
\$37,366,805 Section II of the waterway.

Gulf-Defiles—
\$29,861,840 Section III of the waterway.

Tuscarora Contractors—
Combine of Arundel Corporation, Sponsor
L. E. Dixon Company,
Hunkin-Conkey Construction Company,
\$39,834,292 Tuscarora Power Plant.

Channel Constructors—
Peter Kiewit, Sponsor
Perini Corporation
Morrison-Knudsen
Walsh Construction Company
\$31,855,000 Section IV of the waterway,
plus Aggregate Plant.



Project map—showing how water will be conducted through closed conduits from intake above the falls to storage reservoir and then to the main power house below the falls. The two power plants will generate 2.19 million kilowatts of electricity—enough for the household needs of a city the size of Chicago.



Blaw-Knox self-aligning Airport Forms are placed easily by a small crew at Mather Air Force Base near Sacramento, California.

Blaw-Knox Road and Airport Duo-Forms speed Air Base Paving

Gordon H. Ball, Inc., Danville, California, used more than 11,000 feet of Blaw-Knox heavy duty, self-aligning, 20 x 22-inch Blaw-Knox Duo-Forms in paving runways, taxiways, warm-up, and operational runways at Mather and McClellan Air Force Bases in Sacramento, California.

Henry J. List, project manager for Ball, said, "The Blaw-Knox Duo-Forms are simple to set in place and remove. And we can use either the 20- or 22-inch face for forming."

The \$17 million contract for widening and extending runways and construction of additional taxiways and aprons will complete the conversion of the air bases for

handling jet bombers. The job required more than 520,000 cubic-yards of concrete, which was placed in an assembly line operation.

Easy placement and removal of the Blaw-Knox Duo-Forms made the concrete paving schedule easy to maintain. Set 25-feet apart, their accuracy made it possible to guarantee the level of concrete within one-eighth inch.

Contractors like Gordon H. Ball, Inc. rely on rugged Blaw-Knox forms for economy, efficiency, and a high re-use factor. Your Blaw-Knox distributor will assist you in selecting the right Blaw-Knox Form for highway and airport, curb and gutter construction. Why not see him soon?



BLAW-KNOX COMPANY

Construction Equipment
300 Sixth Avenue
Pittsburgh 22, Pennsylvania

EQUIPMENT NEWS ... continued



Versatile Loader

The Case 210 loader lifts 1,000 lb to a maximum height of 10 ft 5 in. It dumps at 45 deg and has a 30-in. reach. Close-coupled 11, 13, or 18-cu-ft buckets cut 5 in. below grade, roll back 17 deg for heaping, tilt forward 90 deg for backfilling and finishing.

In 5 min the bucket on the loader can be changed for a pallet fork, bulldozer blade, crane boom, sweeper, or another bucket. The tractor also may be equipped with a 10-ft Case-built backhoe.

The rig has a four-cylinder, 34-hp engine developing 106-ft-lb maximum torque. Power train includes four-speed forward transmission and 100% anti-friction bearings. Forged, one-piece front axle with heavy-duty steering knuckles can be equipped with optional power steering.—J. I. Case Co., Racine, Wis.



Seven-Wheeled Roller

All seven wheels on this diesel-powered roller oscillate independently. The weight of the rig can be varied from 11 to more than 33 tons. It is equipped with a torque converter and reversing transmission; it operates at the same speeds forward and reverse.

The open ballast box, with a 520-gal capacity, is easy to load and doesn't obstruct the operator's visibility. Size of the smooth-tread tires is 10:00x24.—Browning Mfg. Co., Box 2707, San Antonio, Texas.



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ALL CAPACITIES: DIMENSIONS RANGE FROM 20' TO 327' LONG,
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Tough, rugged Frederick Drop Balls eliminate expensive drilling, blasting . . . deliver smashing low cost power when you want it, where you want it. Exclusive "Pear-shape" design drops straight—swings true—withstanding greater impact. Balls 4000 lbs. or over are made of extra durable nickel alloy—or special alloys furnished on request. "E-Z" Swing recessed steel eye gives greater cable protection plus free swinging action. Balls can be furnished with replaceable pins. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Special release hooks for free dropping also available.

Wide range of sizes and weights:						
Pear shape (lbs.)	1500	2000	3300	4000	5200	6500
Ball shape (lbs.)	500	1000	2000	5200		
Spherical shape (lbs.)	470	950	1650	2400	3000	3700

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GEBRÜDER
KULENKAMPFF GMBH
Altenwall 21-23
BREMEN (Germany)

EQUIPMENT NEWS ... continued



Traction Equalizer

Trucks equipped with the new Rockwell Traction Equalizer have better traction and are easier to control on curves, slippery pavements, or soft ground.

The device automatically transmits a substantial increase in tractive effort to the wheel with the best road adhesion. It reduces wheel spinning and the tendency of a vehicle to swerve when one wheel suddenly loses traction.

The manufacturer says it is so effective that it will propel a vehicle even if one of the driving wheels is completely off the ground. Each axle of trucks with more than one drive axle may be equipped with the unit.

The only new parts needed to install the self-lubricating unit are axle shafts and differential cases. The differential nest remains standard.—Rockwell-Standard Corp., 843 Fourth St., Coraopolis, Pa.



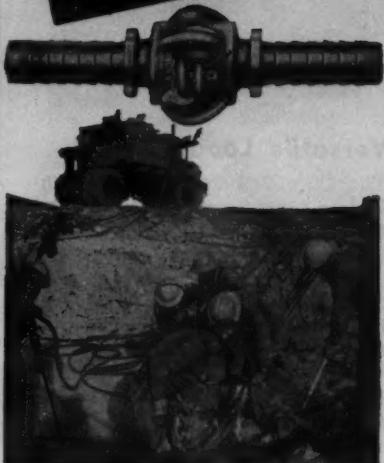
Self-Cleaning Tamper

Adjustable cleaner bars with wedge-shaped spades automatically remove dirt from between the tampers of this new model 6060 Chester roller. The tampers are flat and have a bearing surface of 7 sq in. per foot. Wedge round, or sheepfoot tampers are available as optional equipment.

Each drum has a diameter and width of 60 in. The frames for the drums are linked with a hinged pin assembly and are designed for handling in cramped quarters.

Each drum has a welded screw type fitting for the addition of ballast.—Chester Products Inc., Hamilton, O.

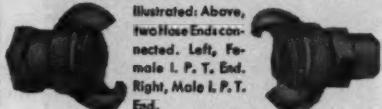
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Tight, Pressure -
Proof Connections*



"AIR KING" *Quick-Acting, Universal HOSE COUPLING*

**FOR COMPRESSORS, ALL TYPES
OF AIR TOOLS, WATER, OIL
AND SPRAY SERVICE**

This versatile coupling is built along plain, rugged lines to assure long, trouble-free service under severest working conditions.



Illustrated: Above,
Two Hose Ends con-
nected. Left, Fe-
male I.P.T. End.
Right, Male I.P.T.
End.

The "Air King" will reduce operating costs wherever quick connections are required. Locking heads are identical for all sizes of hose or threaded ends within the coupling's size range, and are locked by pressing together and applying a quarter-turn. Equipped with patented Safety Locking Device. Bronze or rustproofed malleable iron, in sizes up to 1".

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DIXON VALVE & COUPLING CO., LTD., TORONTO Associate Companies
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ALEMITE SURGEPRUF reusable hydraulic hose and couplings

The quality line for original equipment . . . the preferred line for fast, easy on-the-job replacements! Let Surgepruf be your one dependable source of hose, couplings and components for every industrial and automotive application! High-pressure, medium-high pressure and low-pressure hose for temperature operating range of -40° to +275°F. Couplings are reusable. Complete range of hose sizes and couplings, as well as adapters and swivel adapters. One of Alemite's 34 strategically located distributors is ready to give you prompt, complete service!

Medium-High and High-Pressure Hydraulic Hose and Fittings. Single and double wire braid hose. Non-skive feature assures easy assemblies in seconds. Seamless inner tube of Buna-N rubber and Neoprene outer cover. Resists abrasion, weather and oil. High strength reusable couplings. No special tools required.

New Low-Pressure "Shur-Lock" Hose—for use on fuel, filter, oil, air and vacuum gauge lines. Rugged, precision-matched couplings. Leak-proof grip. General purpose hose and coupling utility kit eliminates need for large inventory.

**Replacement or Display
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Permits fast, easy on-the-spot assemblies for most common low-pressure automotive applications.



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For low pressure fleet, automotive and industrial general purpose use.



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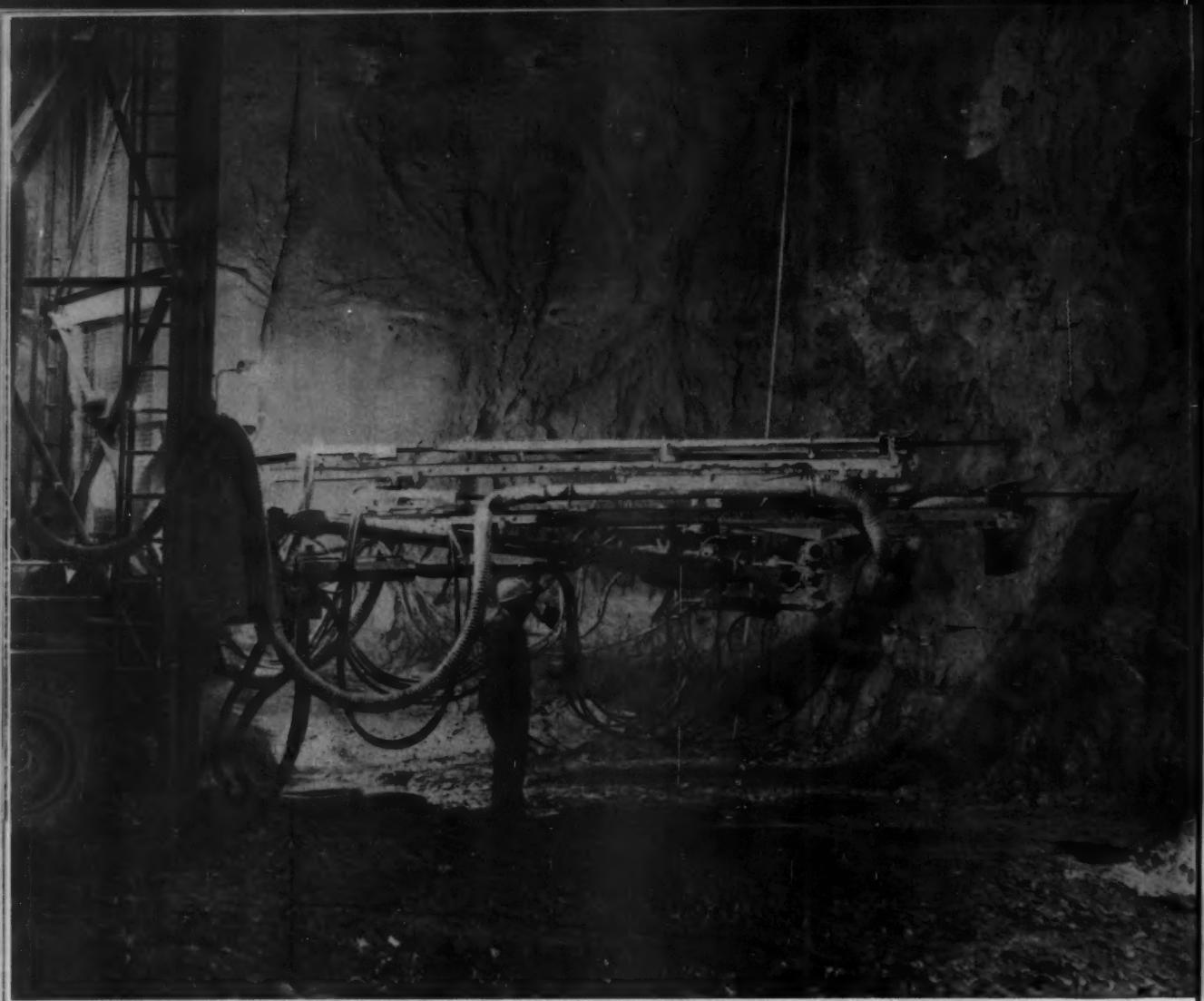
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A complete selection of reusable couplings, adapters and swivel union adapters for most medium-high pressure industrial and farm equipment hydraulic lines.



ALEMITE
DIVISION
STEWART-WARDNER
CORPORATION



Biting deep into limestone in Mississippi River bluffs

Here Bethlehem Hollow Drill Steel is drilling a 72-hole-round, blast-hole pattern at the huge limestone quarry of Solvay Process Division, Allied Chemical Corporation, at Prairie du Rocher, Ill.

The quarry management is using the room and pillar method of rock removal. Faces in the Salem Limestone are 30 ft high, and about 50 ft wide. The Bethlehem Hollow, fitted either with one-use or carbide-insert bits, drills holes as deep as 15 ft.

You can always count on economical drilling with Bethlehem Hollow. It's tough and fatigue-resistant, and

has a uniformly round hole. And having a wide quenching range, Bethlehem Hollow is easy to heat treat so that you get the right degree of toughness and wear-resistance for strong threads and long-wearing shanks.

Bethlehem Hollow Drill Steel is furnished in Carbon and Ultra-Alloy grades in rounds, hexagons, and quarter-octagons. It comes in easy to handle lengths from 18 ft to 27 ft, and longer.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



EQUIPMENT NEWS ... continued



More Power, Weight

A turbocharger in Caterpillar's new MD7 pipelayer increases flywheel horsepower from 128 to 140. Weight of the new rig has been increased 200 lb with either five or seven-roller track frame.

Lifetime lubricated track rollers, carrier rollers, and idlers are standard equipment on the MD7. Rollers and idlers are lubricated during factory assembly and need no additional lubrication until the rig is rebuilt. The transmission lube system has pressure-lubricated bearings, oil-sprayed gears, and full-flow filtration.

Final drive gear strength has been stepped up by using gear teeth with coarser pitch. Track-shoe bolt diameter has been increased from $\frac{5}{8}$ to $\frac{3}{4}$ in.—Caterpillar Tractor Co., Peoria, Ill.



Corner Form

A corner form, designed to cut concrete form setting time and eliminate loose hardware, is made of $1\frac{1}{8}$ -in. plastic-impregnated plywood fitted with welded steel braces. The braces are $\frac{1}{4} \times 2$ in.

The unit has retractable levers



Get the

SOLID POWER of a Remington concrete vibrator

You're looking at the business end of Remington's new Model EV-25 motor-in-head vibrator. Users say it's the best electric motor-in-head vibrator made, and Remington guarantees it for 6 months. The Model EV-25 is just one of 11 concrete vibrator models available from Remington. Ratings range from 1 to $6\frac{1}{4}$ hp in air, electric or gasoline-powered models. Interchangeable shafts, housings and heads enable equipment to be adapted to widely varying conditions. Mail coupon or write for performance data and specifications on the new Model EV-25 and the complete line of Remington concrete vibrators.

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"Eucs" S-18

Easy operation, big power, and independent hydraulic controls cut cycle time... "Eucs" average 10 loads per hour on 3500' round trip cycle.

Reliable performance of "Eucs" gives you a bidding advantage... helps protect your profit margin!

Building of the \$137 million Keystone Dam, west of Tulsa, Oklahoma, on the Arkansas River, necessitates relocation of two main line railroads. One of these projects is 14.5 miles in length and involves 5,418,000 cu. yds. of earthmoving. Cosmo Construction Company has a 1.7 million-yard contract with the Army Corps of Engineers, Tulsa District, for two of the four railroad embankment sections on this big relocation project.

Cosmo is using 4 Euclid S-18 scrapers with 4-speed Torqmatic Drives and converter lock-ups. Material being loaded is of two types—hard shale and clay hardpan. A Model TC-12 Euclid Twin-Power Crawler and another tractor of over 200 h.p. push-load the scrapers. On round trip hauls of approximately 3500 ft., each S-18 averages 100 loads per 10 hour shift for a production of 220 bank yds. per hour.

Project Manager Stell Dobbs uses the big Euclid TC-12 for push loading the scrapers in



the heavy shale—a very difficult material for scraper loading. In this way he makes effective use of the 425 net h.p. in the pusher and 336 h.p. in the scraper—Torqmatic Drive in both machines helps to make this combination a high production team on a tough job.

See your Euclid dealer for information on the complete line of Euclid earthmovers... he can show you how big power, big capacity, big performance "Eucs" can bring you a better return on investment.

EUCLID Division of General Motors, Cleveland 17, Ohio

Watch for Euclid's Big 3 Power Parade in your area!



EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Scrapers Maintain High Production on Railroad Relocation Project

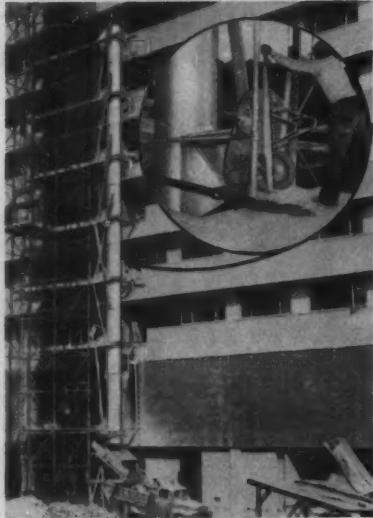


Here's big power at work . . .

TC-12 "Twin" Crawler (425 net h.p.) and S-18 Scraper (336 h.p.) team up to get a 22 bank yd. load of heavy shale in a hurry.



Easier, Better Handling of Construction Refuse Disposal!



Reusable, Adjustable Metal Chute is Quickly Assembled and Disassembled

Field use of Wilkinson Scopeable Metal Chutes has proved their advantages over conventional wood types.

Consisting of large, round telescoping metal tubes, these chutes have large intake openings adjustable to any floor height. As the building progresses, the chute is extended and intakes added. At job completion the chute is easily disassembled for storage or removal to another job.

Advantages . . .

Savings in chute construction and dismantling time.

Savings in the construction refuse disposal operation.

Better, more dust free construction refuse disposal.

A decided tax advantage as Wilkinson Reuseable Chutes can be depreciated as a capital investment.

Write for complete details.

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CHUTES, INC.**

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EQUIPMENT NEWS . . . continued

and hooks at each end, making it possible to use the form as a regular inside or opposite corner with either inside or outside panels. The unit can also replace double-hook and double-lever panels on cross-walls.

Standard sizes are 8 x 8 in. wide in 4, 6, 8, or 10-ft heights. Other sizes, including 6 x 6-in. and 4 x 4-in. widths, also are available.—Simplex Forms Systems, Inc., Box 85, Rockford, Ill.



Light, Easy-to-Use Drill

Bucyrus-Erie's Winkie drill can be set up in five minutes and operated by one man. The new drill weighs 45 lb, is 19 in. high and 21 in. wide. It is powered by a two-cycle, air cooled gasoline engine, producing 5½-hp at 5,000 rpm.

The manufacturer says the Winkie avoids unnecessary diamond wear, because rotation stops automatically when engine speed falls below 900 rpm. The drill also stops when the water goes below the safe minimum.

In shallow drilling the Winkie can recover cores up to 8 in. in diameter, and 15/16-in. cores can be recovered down to 200 ft. An overhead drive principle makes possible runs of 10 ft.

A vacuum carburetion system permits the drill to work continuously at any angle without a mechanical turret arrangement. Other features include a circular holding ring, a recoil starter and nylon cord for starting, a washable air filter, and a "bullseye" level to help start vertical holes.

Standard core barrel lengths run to 18 in., but longer ones are available. Maximum speed of the bit is 2,000 rpm.—Bucyrus-Erie, Drill Division, Richmond, Ind.



CONSTRUCTION CASTINGS OF

- ★ SOUND QUALITY
- ★ SUPERIOR FINISH
- ★ SOLID VALUE

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Patterns on hand for over 15,000 different Gray Iron and Ductile Iron construction castings.

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Preventive Maintenance At Work



"We've extended the time between air filter service from every 5 hours to once every 10 days—and run engines thousands of hours longer with Purolator Dry Type Air Filters"

says Mr. A. E. Burgess, A. E. Burgess Contracting Co., Inc., Birmingham, Alabama

The A. E. Burgess Co., Inc. is nearing completion of a program to install Purolator Dry Type Air Filters on all equipment because of their dramatic performance under the toughest road-building conditions.

Purolator Air Filters have drastically reduced down-time, and have extended the time between air filter service from once every 5 hours to once every 10 days.

On-the-job records also show that Burgess' 600 CFM Ingersoll Rand compressors had previously required an overhaul every 3,000 hours. To-

day, those same compressors, with Purolator Air Filters, have already run well over 4,000 hours without showing any need for an overhaul in the near future.

Similarly, the between-overhaul life of the 6-71 GMC diesel engine which powers the compressor has been greatly increased. Burgess records show that the two-stage Purolator Air Filter element (AF-1616) has extended engine use from 1,200 hours to an anticipated 10,000 hours.

Purolator Dry Type Air Filters are available in a variety of sizes to fit

and protect all types of highway and off-highway equipment with effective air filtration under the severest dust conditions.

Without obligation, a Purolator Engineer will be pleased to demonstrate the greater advantages and economies of dry type air filtration . . . how to reduce costs through increased engine life, and reduced time and maintenance expense.

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Interstate Highway Bridge—Iowa



Prescon Hangers in Position



Illinois Toll Highway Bridge



Vallejo, Calif. Interchange

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Building of today's overpasses, interchanges, and related projects require the latest in engineering advances and construction techniques. . . . And with increasingly keen competition on all types of concrete construction, contractors have found that the efficient forming methods of **SUPERIOR** Accessories offer all-important bidding advantages.

When you need form hangers for decks, threaded coil ties for walls, or heavy-duty screed supports for heavy screeding equipment, specify **SUPERIOR** and you'll finish the job on time! The jobs shown here used the **SUPERIOR** Accessories illustrated below.

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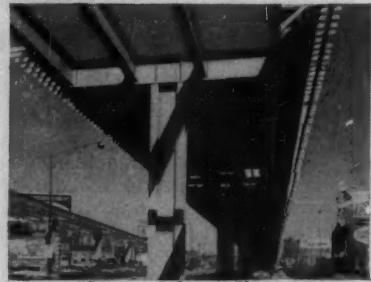
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BULLETIN
BB-458



Deck Supported with Superior Hangers



Chicago-Calumet Skyway



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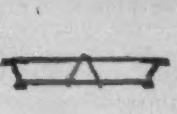
SCREED CHAIRS



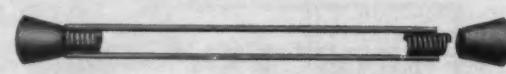
Coil Hanger Frame



Plate Hanger Frame



Prescon Hanger



CONE-FAST COIL TIE



TIILT-LOCK ASSEMBLY

SUPERIOR Concrete Accessories, Inc., 9301 King St., Franklin Park, Ill.
(A Suburb of Chicago)

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HOUSTON OFFICE
4101 San Jacinto, Houston 4, Tex.

PACIFIC COAST PLANT
2100 Williams St., San Leandro, Calif.



Maximum Density Roller

The model SP-900 pneumatic-tired roller exerts a compaction effort of 85 psi. The new unit is designed for rolling asphaltic mats and other finish surfaces and has a rolling width of 64 in. The roller is equipped with an automatic power reverse control and a torque converter. It has six speeds in both forward and reverse. — Tampo Manufacturing Co., Inc., P.O. Box 4248, Station A, San Antonio 7, Texas.



New Hough Payloader

The new H-120 Hough Payloader features higher dumping clearance and a greater reach. The unit has a dumping clearance of 10 ft 10 in. under the cutting edge with the bucket fully dumped and a forward reach of 3 ft 6 in. from the front tire.

Bucket sizes range from 3 to 6 cu yd, and the recommended carry capacity is 12,000 lb. For digging operations the H-120 develops a break out force of 26,000 lb.

The Payloader is powered by a 300-hp turbocharged Cummins diesel engine and is equipped with a four-speed transmission capable of travel speeds up to 28 mph. Air brakes and power steering are standard equipment.

The unit is also equipped with power-transfer differentials for overcoming slippery ground conditions. This differential automatically transfers additional torque

• NOW... a Portable Batcher at Really-Low Initial Cost!



on the job mixing...
moments after you arrive!

Boardman's new Portable Batcher produces ready mix in the capacity demanded by today's contractors, yet its initial cost is really low!

Moments after you arrive on the job, the Boardman batcher starts providing ready-mix at high capacities, saving your crew's time and increasing their work capacity. Its extremely low operating and maintenance cost, coupled with the low initial investment, make this the most profitable piece of equipment you'll ever own!

The basic batching unit includes all the necessary equipment for complete, efficient operation. The hopper's radial gates open on a 24-inch conveyor belt. A flexible water line is separated from the rubber loading sock for controlled, non-stick discharge. Three-beam-scale box is within easy reach of the operator. With the addition of overhead bin and bulk cement silo, the Boardman batcher becomes a complete, high-capacity ready-mix plant.

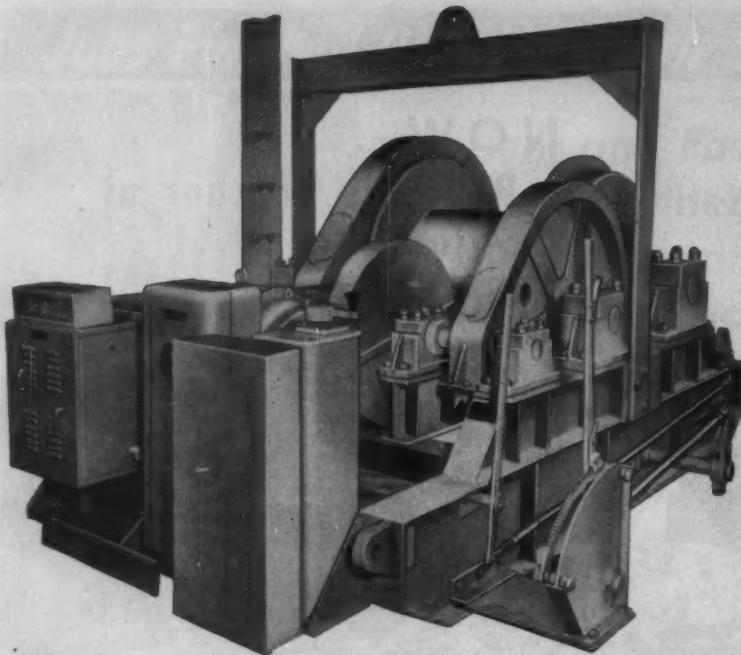
Complete two-wheeled portability of the Boardman batcher, on-the-job and on-the-road, means you set up at out-of-the-way job sites and move from job to job in the shortest possible time.

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"ALL STEEL" ERECTION HOISTS

*safe · reliable
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These combined qualities are all included in the hoist shown and are provided by "All Steel" construction, no clutch, single lever "Deadman" type electrical control, lifting hitch for moving, and husky tie backs for anchoring.

The load is over 200 tons on multiple parts of line requiring a drum capacity of over 3000 ft. of $1\frac{1}{4}$ " cable, the lift must be made with absolute assurance of reliability and the answer is a S-L-M "All Steel" erection hoist. Consult Superior-Lidgerwood-Mundy for your next reliable hoist.

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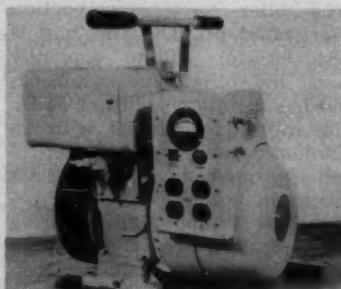
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MAYO
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LANCASTER, PENNSYLVANIA

to the wheel with the best footing.

The operator has complete visibility during all operations, and the operator's compartment is protected by a canopy cab equipped with front and rear windshields and windshield wipers. Daily and periodic servicing has been made easier by two special access panels for servicing electrical and hydraulic components. They are in addition to the regular service panels. The standard unit has 26.5x25, 14-ply tires. The Frank G. Hough Co., 706 Seventh Street, Libertyville, Ill.



Portable Electric Plants

Two new portable electric plants with generators producing 120-v, single-phase power are driven by four-cycle air-cooled gasoline engines. The units weigh 192 lb and 255 lb, and their output is 3500 w and 4500 w.

The generators can send power to four outlets at once, or they can feed into a single outlet. Each model has a built-in rpm meter with red and green color indicator, a battery charger, and electric starter, shock-absorbing feet, built-in carrying handles, and extra plug-in receptacles.—Pacific Mercury, 14052 Burbank Blvd., Van Nuys, Calif.

Stronger Ripper

Caterpillar's No. 9 ripper has a new five position steel clevis that is 33% heavier and more than twice as strong as the previous model. The clevis, combined with a new four-hole shank, makes possible close control of the ripping angle and ripping depth.

The operator can get three ripper positions when the tooth is in low position and two ripper positions with the tooth in high position. A sixth position is available for carrying.—Caterpillar Tractor Co., Peoria, Ill.



Steel Replaces Wood in Mountain Pipe Line. More than thirty years ago, the Pennsylvania Power & Light Company built a wood-stave conduit in the Pocono Mountains. Now the old conduit, which ran from Lake Wallenpaupack to a hydroelectric plant 3½ miles away, has been wholly replaced by an all-steel pipe line. Final "can" section of the new steel line is shown being lowered into position.

The big "can" is 38 ft 6 in. long and has a diameter of 14 ft 1 in. Together with its temporary saddles, it weighs approximately 20 tons. Handling this and similar heavy loads was a job for Bethlehem wire rope—always a dependable performer. Bethlehem slings were also used in the rigging, so that every lift could be made with complete assurance.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Expert Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem Wire Rope.

BETHLEHEM STEEL



How Case Construction Corporation from \$12,000 in 1948 to \$4 million of



\$1.1 million bridge project. Jones Falls Expressway, Baltimore, Maryland. Required 55,500 cu yds of excavation, 5,200 cu yds of structure excavation, 4,800 ft of H piles, 630,000 pounds of steel reinforcement, 990,000 lbs of structural steel.

In 1958 some 9,300 contractors did \$100,000 or more of construction. Of this total, only 3,200 firms received \$1 million or more in contract awards. These latter firms received 84% of the total contracts awarded the \$100,000 and over contractor group.*

Case Construction Corporation of Mount Airy, Maryland is one of the contractors in the million a year group, and has been in business only ten years. This contracting firm is an outstanding success story. Mr. H. D. Case, president, gained his construction experience with some of the country's top contracting firms where he worked as a construction superintendent. In 1948 he struck out on his own. He started his contracting business with a net capital of \$1,000. His first contract was for \$12,000. His know-how and ingenuity contributed to the firm's rapid growth and by 1958 he incorporated. By 1958, Case Construction Corp. reached its high of \$4.1 million of completed construction.

One of the keys to the success of this contractor was his ability to select good key men. Mr. Case attributes much of the firm's growth and success to his five superintendents and their outstanding construction know-how and ability. "Without them, the or-

*As reported by Construction Daily

\$1.3 million dam project in Occoquan, Virginia. Some of Case's equipment shown in operation. This dam project required 55,000 yds of concrete.



ganization would not have grown to its present size and scope", says Mr. Case.

\$18 million of construction completed in period 1948-58

Case Construction Corp. engages primarily in bridge, dam, concrete foundation and steel work. The firm's operations extend from Pennsylvania, Maryland and Virginia to North Carolina. One half of all contracts are in joint venture with W. E. Graham & Sons of Cleveland, North Carolina.

In the period 1948 through 1958, Case did \$18 million of construction . . . an average of \$1.8 million per year. The firm hit its peak of \$4.1 million in 1958. The staff of the organization now numbers 20 key men on the permanent roster and up to 175 workmen at the peak of operations.

Equipment used in Case construction operations

The nature of work performed by Case dictates his need for certain types of equipment. A wide variety of large and small units of equipment make up Case's inventory . . . but major types consist of the following:

- 12 crawler and truck cranes—
(Koehring, American, Manitowoc)
- 10 air compressors—(Ingersoll-Rand)
- 2 crawler-tractors—(Allis-Chalmers)
- 1 grader—(Caterpillar)
- 2 tractor trailers—(Dodge, Ford)
- 18 pickup and 2-ton trucks—(Ford, Dodge)
- 30 pumps—(Gorman-Rupp, Jaeger, CH&E)
- 10 table saw rigs—(CH&E)
- 5 generators—
(Caterpillar, Schramm, International)
- 30 vibrators—(all makes)
- 6 welding machines—(Hobart, Lincoln)
- 1 twin-engine airplane—(Cessna)
- 5 office trailers
- 2 company cars—(Cadillac, Plymouth)
- 4 tool trailers—(Trailmobile, Fruehauf)
- 1 utility crane—(Case)

Pictured below is Case Construction Corporation's twin-engine Cessna which is used extensively by president Case in visiting his out-of-state projects.



n of **grew construction in 1958**

\$200,000 a year invested in construction machinery

According to president Case, his firm operates most efficiently by keeping his equipment new and modern. In 1958, for example, some \$200,000 was invested in new equipment purchases. Mr. Case says, "I try to turn over our major equipment before it gets worn to the point requiring major costly repairs and maintenance. This enables me to have top running, efficient equipment and keep my maintenance and repair expenditures down." Only new equipment purchases are made. Case's investment in construction materials such as steel, forms, concrete and lumber used in bridge, dam, and foundation work ran approximately \$2 million in 1958.

Many influence equipment purchases at Case Construction Corporation

According to Mr. Case there is always a diversification of titles and responsibilities that exert an influence on the purchase of construction machinery. Only in this manner can a contracting operation make the smartest buying decisions based on the experience and knowledge of the men who operate equipment, supervise projects and direct contracting operations.

This purchasing influence of many different men holds true in the Case Construction Corp. Here's what president Case says about his purchasing operation:

"Before we go into the purchase of a piece of equipment, I always discuss the relative merits and performance of the type and make of equipment with my operators and superintendents. I discuss the subject fully with my key men and from these discussions we base our buying decision."

Case uses airplane to speed construction operations

H. D. Case is a contractor who knows no regular working hours. His seven day a week work schedule takes him from project to project where he personally checks the progress of work. Mr. Case has found it extremely vital to his operation to purchase and maintain a twin engine Cessna with a full-time pilot. It is the only way that he can make quick trips to his projects which extend into several states, coordinate operations through speedy transfer of key personnel, and generally make his operation more efficient. "I don't see how any contractor working out of state as we do can operate without a plane", says Mr. Case.

Million-dollar-contractors like Case Construction Corp. play an important role in the construction industry and nation's economy as they help change the face of America. As they carve out new heights of construction with hundreds of men, equipment, and materials, many segments of the industry and



**Mr. H. D. Case, President
Case Construction Corporation**

A subscriber to CONSTRUCTION METHODS Magazine for over 22 years says:

"I have been reading CONSTRUCTION METHODS since 1937. Its descriptions of new techniques are particularly helpful to me. It has given me many a good idea, shows how other contractors tackle jobs and thereby has helped me solve many problems of my own. I also find it helpful in selecting equipment I need. I read the advertisements which are informative and helpful."

There are 7 key men in Case Construction Corp. who subscribe to CONSTRUCTION METHODS Magazine.



\$800,000 bridge project. Richmond-Petersburg Turnpike. Bridge was approximately 1,000 ft in length and required 5,600 yds of concrete and 1,000 tons of structural steel.

nation's economy benefit from these contracting operations.

And the facts show why construction machinery advertisers must reach the many buying influences in contracting firms with their sales messages. Consistent advertising in CONSTRUCTION METHODS AND EQUIPMENT is the most effective means of reaching key men in important contracting firms like Case . . . creating brand recognition and preference for your product and paving the way to higher sales.

Construction Methods

AND
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New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.



SPRAGUE & HENWOOD MAKES THE EQUIPMENT FOR THE SOIL SAMPLE OR ROCK CORE YOU WANT

With the earth-shaking increase in construction, you need efficient, versatile sampling and coring equipment.

Sprague & Henwood, Inc., a leading manufacturer of all types of equipment for foundation investigation, has just the right type for you!

Illustrated above, on location, is a truck-mounted Sprague & Henwood Model 30 Core Drill Machine. On this foundation project this machine is recovering both good samples and good cores. The soil samples have already been recovered from this boring and now the machine is being used to core rock. Because of the versatility and economy of this machine it is becoming a favorite of many

contractors and other users throughout America.

The proper machine alone will not give you the good soil samples and rock cores you want. You need just the right samplers, accessory equipment and coring bits. If you need a sampler to determine only the general classification of the sub-surface soils or a sampler to secure samples for testing in a soils laboratory, Sprague & Henwood has it. There is a complete line of accessory equipment and the best in "Oriented" Diamond Bits awaiting you. One call . . . to SPRAGUE & HENWOOD, Inc., and your drilling equipment needs can be met.

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ALLIS-CHALMERS BOOKLETS

—Twelve new literature items are available from Allis-Chalmers. Form TL-2044 is entitled "New Opportunity in Soil and Water Conservation for Farmers and Contractors". The March-April, 1959, issue of the Allis-Chalmers Reporter, published by the Construction Machinery Division, devotes the entire issue to a special report on the significance of conservation projects to earthmoving contractors. Catalog BU-528 covers the G-149 engine and Catalog BU-531 covers the G-226 engine. Two recently introduced power plants, the 21000 and the 16000 diesel engines are described in Catalog BU-540. A 4-p bulletin, MS-1328, describes how the 21000 engine is used as the power plant for the HD-21 tractor. Three folders, BU-302A, BU-452, and BU-453, describe Allis-Chalmers lift trucks, including the recently introduced, 2,000-lb capacity Hefty FT. The following three specification sheets are also available: MS-1325 covers the Model forty five motor grader; MS-1192 covers the HD-16 tractor; and MS-1284 covers the HD-16 DC and D diesel powered tractors. — Allis-Chalmers Mfg. Corp., Milwaukee 1, Wis.

DIESEL DATA—Reasons why "Diesels Out-Perform Gasoline Engines" are contained in a brochure of that title just released by the Detroit Diesel Engine Division of General Motors. The booklet compares diesels to gasoline engines on points such as work-producing ability, economy of operation and life span.—Detroit Diesel Engine Division, General Motors Corp., Detroit 28, Mich.

WARNER & SWASEY CO.—An illustrated folder describes the newly-introduced larger size Gradall, Model G-1000. This machine has a lifting capacity of 7 tons and normally will dig to a depth of 18 ft. Boom extensions increase the depth to 27 ft. Load-

ing height is 18½ ft. The Badger Division now has a catalog showing its new Model 500 TM, 200 SPR and 200 SPC, plus the complete line of attachments for all Hopto backhoes.—The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, Ohio.

GENERATING INFORMATION

—A new series of educational pamphlets covering complicated electrical and technical characteristics of engine driven generating equipment has been published by D. W. Onan & Sons, Inc. The series is entitled "Power Talks from the Sales Department". To date the following four pamphlets have been issued: M-100 describes the methods of Onan excitation including static excitation for alternators through magnetic amplifiers, saturable reactors and rectifiers; M-101 compares running hours of operation between an electric generating plant engine and the average automobile engine; M-102 discusses various engine fuels such as gasoline, gas and diesel oil; and M-103 discusses the operation of electric motor loads with revolving field generating plants.—D. W. Onan & Sons Inc., Minneapolis 14, Minn.

TORQUE CONVERTERS—"How to Get the Most out of Shovel-Cranes with Torque Converters" is the title of a new 16-p booklet issued by Link-Belt. Prefacing the tips on operation and maintenance is an introductory explanation of what torque is and how it applies to shovel-cranes. Immediately following is a comparison of performance differences between torque converters and fluid couplings. Book 2740.—Link-Belt Speeder Corp., Cedar Rapids, Iowa.

ROAD EQUIPMENT — An 8-p catalog describes the full line of Seaman-Gunnison road construction and maintenance equipment, including the newly introduced Tri-pactor, a self-propelled compaction unit that combines pneumatic and vibratory compaction and flat steel rolling. Also covered are the S-G 6-yd utility scraper and the Duo-Pactor. Form SG-25.—Seaman-Gunnison Corp., 2763 S. 27th St., Milwaukee 15, Wis.

ELECTRIC BLASTING—"Handbook of Electric Blasting" by D. M. McFarland and G. F. Rolland is an informative 60-p publication

Big, New Model H-120



PAYLOADER®

OUTSTANDING FEATURES and PERFORMANCE

POWER: 300 hp. turbocharged Cummins diesel handles peak loads of both torque converter and hydraulic pumps without "lugging down."

EASY OPERATING: Power steering, power air brakes, power-shift transmission. Exclusive dual brake pedal control.

SAFE AND STABLE: All moving parts and pivot points ahead of operator for safety and unlimited visibility. New design high strength alloy steel boom arms permit 40° bucket tipback on ground, 75° at carry.

CAPACITY: 12,000-lb. carry capacity, 26,000-lb. breakout force.

HIGH DUMP, LONG REACH: At maximum height, clearance to bucket edge (dumped) is 10'-10"; reach from tires is 3'-6".

EXTRA ENGINE PROTECTION: Donaldson "Donaclean" dry-type air cleaner removes 99.8% of dust, needs 75% less service time.

TRACTION: 4-wheel drive, power-transfer differentials, planetary final drives. 26.5 x 25 tires.

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LUDINGTON, ILLINOIS
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RW-1500 Construction Methods & Equipment
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

BATCH TRUCK SPECIAL

For Paving And Traveling Through Sand And For Transit Mix Trucks



ORDERS ARE BEING TAKEN NOW ON TIRES, TUBES, RIMS AND WHEELS ON WIDE FLOTA-TION ASSEMBLIES THAT REPLACES DUALS 825-1000x20 ON SINGLE OR TANDEM AXLES.

HARMO TIRE & RUBBER CO.
1850—18th St. Detroit, Mich.

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120 yd. Johnson semi-automatic concrete batch plant, five compartments (one cement); also 35,000 sq. ft. Atlas (Cirlington) steel speed forms for concrete walls up to two 1-1/4 yd. shovel front attachments for Bay City machines; also unused 3/4 yd. shovel front attachment for 41 Lorain; all eq't. used, in first class condition.

P.O. Box 402, Barre, Vt.

NEW PUBLICATIONS ...

continued

by the Atlas Powder Co. Subjects covered are: the advantages of electric blasting over old methods; the nature and construction of an electric blasting cap; sources of power for electric blasting; tables and graphs for current delivered by standard blasting machines; resistance of copper wire and caps; electric blasting circuits; methods of splicing wires, testing circuits, checking current leakage; and the use of rheostats. The book is sturdily bound for hard use and is small enough to fit into a pocket.—Dept. HR, Explosives Division, Atlas Powder Co., Wilmington 99, Del.

POWER SAWS—DeWalt has issued two new catalogs describing the operation of their heavy duty Imperial line of radial-arm type machines. Form SP-110-57A covers metal cutting applications and Form SP-2-58 covers wood cutting.—DeWalt Division, American Machine and Foundry Co., Lancaster, Pa.

ASPHALT PATCHING—Detailed instructions on how to repair roads and streets by the cold patch methods are given in a pocket-size 24-p booklet entitled "Texaco Cold Patch." Photographs illustrate the proper procedure to be followed.—The Texas Company, Asphalt Sales Division, 135 East 42nd St., New York 17, N. Y.

COMPACTION EQUIPMENT—A 16-p pamphlet entitled "The Use and Application of Compaction Equipment" is an introductory guide to soils and materials compaction, especially on roads, airfields, and dam construction. The booklet emphasizes the need for good compaction of such materials and the results obtained by the various types of compacting equipment in use today. A complete glossary of terms is included.—The Gallon Iron Works & Mfg. Co., Galion, Ohio.

AIR MOTOR JACKS—A 6-p brochure, No. 435-LJ, covers the Joyce Gridland line of Yellow-Jacket air motor jacks. Data is included on all models in the line from 20-ton to 100-ton capacity.—Customer Service Department, The Joyce-Gridland Co., 2027 E. First St., Dayton 3, Ohio.

"THE MAIL MUST GO THROUGH"
— with some help from you!

To speed mail delivery, the Post Office has created postal delivery zones in 106 cities. Be sure to include zone numbers when writing to these cities, and always include your own zone number in return addresses—after the city, and before the state.



Just had my annual medical check-up. (Smart move.) I'm making out a check to the American Cancer Society, right now—that's a smart move, too.

Guard your family!
Fight cancer with
a checkup and a check!

AMERICAN CANCER SOCIETY



Women's Dormitory "A", State University College For Teachers
at Albany. Accommodates 200 students.

Owner: Dormitory Authority of the State of New York

Architect: H. O. Fullerton, Albany, N.Y.

Contractor: Sano-Rubin Construction Co., Inc., Albany, N.Y.

Dealer: Builders Material & Supply of Albany, Inc., Albany, N.Y.

Closeup shows results of good design, good workmanship and quality materials. Lehigh Mortar Cement was used with brick, block and structural tile.



LEHIGH MORTAR CEMENT

- This new dormitory is an excellent example of warm colonial design—its beauty and durability enhanced by good workmanship, and quality materials.

The contractor, Sano-Rubin Construction Company, chose Lehigh Mortar Cement for all masonry. They report "We had used Lehigh Mortar Cement on many previous jobs and have always been more than satisfied with this mortar, and the results produced."

The workability and plasticity of Lehigh Mortar Cement help masons do a good job. Its uniformity and durability contribute to clean, strong, weathertight walls.

Try Lehigh Mortar Cement on your next job. See for yourself how it can help you produce top quality masonry construction.

- LEHIGH MORTAR CEMENT
- LEHIGH EARLY STRENGTH CEMENT
- LEHIGH AIR-ENTRAINING CEMENT
- LEHIGH PORTLAND CEMENT

Lehigh Portland Cement Co.
ALLEGTON, PA.



"We build Sewage Treatment and Water Filtration Plants"



"I build Industrial and Commercial"



"Schools are our specialty"

"We are building Bridges and Overpass Structures"



Each has CONCRETE FORMING PROBLEMS.... ALL are Profitably solved by renting UNI-FORM Panels

Whatever the type of job....it will pay you to investigate the UNI-FORM Rental "Package" Plan

INFORMATION

Send us a set of plans for a job you're bidding. From these, our Engineering Department will tell you:

1. Total form contact area in square feet
2. Total square feet of forms required
3. Number of ties required
4. Forming recommendations

PLUS a complete proposal, advising what it would cost to rent the complete UNI-FORM "Package" for the job.

PRODUCT

A complete, ready-to-use concrete forming "package" . . . tailored (not adapted) to handle your specific job—on a *rental* basis. Forms in the most efficient sizes, Ties, Tie Keys and accessories will be included in the proposal.

SERVICE

When you rent UNI-FORM Panels, you get, at no extra cost, the services of Universal Engineers—experienced concrete forming specialists—who provide complete job details, job-site service.

Contractors all over the country depend on UNI-FORM Panels and Universal Engineering assistance to help keep their concrete forming on a profitable basis. Why

not investigate the UNI-FORM Rental "Package" Plan? There's no obligation. Write for details . . . send us your plans.

UNIVERSAL

FORM CLAMP CO.

1238 N. KOSTNER • CHICAGO 51, ILLINOIS

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Methods Memo...

Who's Who in Construction

The men who run them make construction firms. If anyone still wants proof of that statement, let him look over a list (compiled by McGraw-Hill) of the oldest and biggest builders in the U.S.

He'll find there are 116 firms in the U.S. more than 40 years old; there are 13 at least 100 years old; and there are 77 firms that signed up at least \$25 million of new business last year. Many of them are family affairs, and nearly all carry the names of the outstanding construction men who founded them or made them successful.

A fine example is the J. L. Simmons Co. of Chicago. It's the oldest U.S. contractor, founded in 1818. And in all of the 141 years since its beginning, a Simmons has headed the company.

Third oldest firm is the Guy F. Atkinson Co. of San Francisco. Guy F. Atkinson, now 84 and still active in the business, heads the organization founded by his grandfather in 1838. And since 1849 the oldest son of each of four generations had headed the William L. Crow Co. of New York, fifth oldest U.S. firm.

Some of the oldest contractors also are among the biggest. Among the top 10 firms, (in total volume of 1958 contract awards) are Peter Kiewit Sons' Co. of Omaha, founded in 1884; Merritt-Chapman & Scott Corp. of New York, founded in 1860; Morrison-Knudsen Co. of Boise, founded in 1912; George A. Fuller Co. of New York, founded in 1882; Perini Corp. of Framingham, Mass., founded in 1885; and S. J. Groves & Sons Co. of Minneapolis, founded in 1905.

Want This Job?

A lot of contracts contain specifications and other requirements that may seem unreasonable. But here's one that's hard to match.

The government of Portugal has invited bids for construction of a 1 3/4-mile toll bridge across the Tagus River in Lisbon. Among the requirements:

- The successful bidder must deposit guarantees amounting to about \$700,000, and if he goes bankrupt during the job he will forfeit his deposits.
- The contractor's work will be supervised by a committee to be appointed by the government—but paid by the contractor.
- No drawings are available; design work apparently hasn't reached the blueprint stage. It's likely the contractor will have to complete the design before he can begin work.

Contractors, Unions Get Together

A new national construction organization is getting set to tackle a variety of the industry's problems. It's called the Construction Industry Joint Conference, and it's composed of representatives of the 18

Building Trades Unions and of the Associated General Contractors and other national general and specialty contractors' associations.

One of the top objectives of the new group is to fight for a bigger share of the construction work at industrial plants. Industrial firms now handle a lot of this work with their own forces.

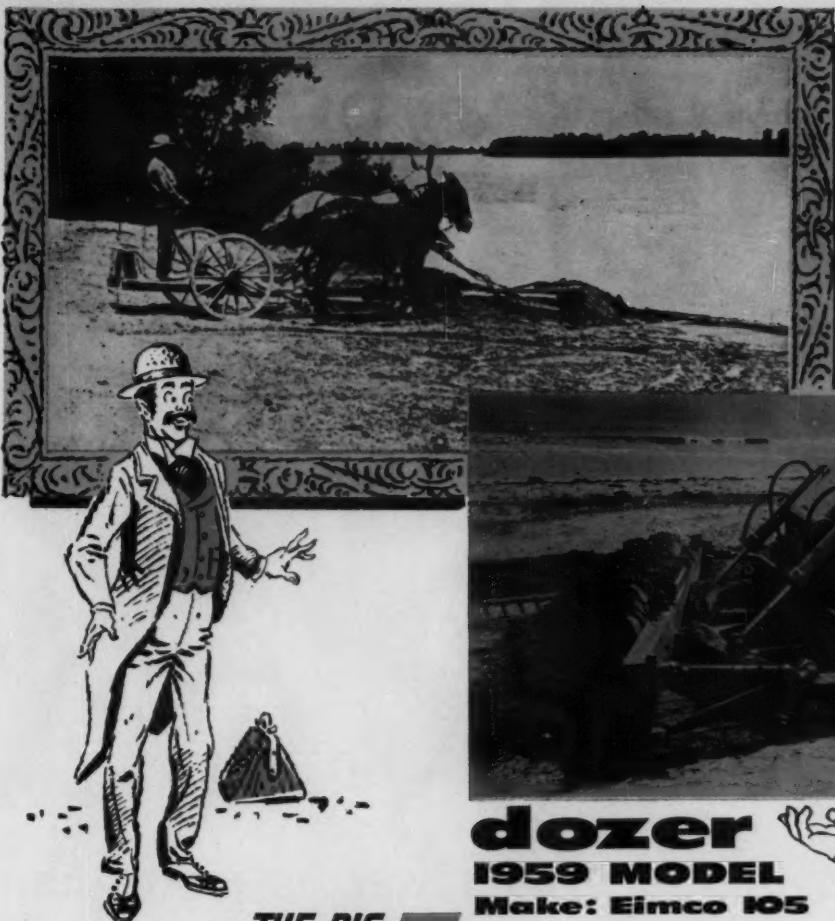
CIJC also will study ways to strengthen apprentice training programs, improve cooperation between contractors and unions, and raise productivity. Eventually it may go into such contractor-union problems as work rules, travel time, and the manning of jobs.

Administrative arm of the CIJC is a Joint Administrative Committee of 16 members, eight from the unions and eight from contractor organizations. John T. Dunlop, Harvard University economics professor, will serve as the impartial chairman of this committee. He is a former chairman of the National Joint Board for the Settlement of Jurisdictional Disputes.



Piggy-Back Concrete

Transmit-mix trucks chute concrete from railroad flatcars in construction of electric power transmission towers near Dallas, Tex. The site is inaccessible by road but parallel and only a few yards away from the tracks of the Santa Fe Railway. So contractor L. E. Meyers Co. pours the concrete directly from trucks riding the flatcars.



dozer

1917 MODEL

Make: Frazier-Davis
Construction Co.



dozer

1959 MODEL

Make: Eimco 105

THE BIG 

THE MODERN BULLDOZER...



Only forty-two years ago, this two mule-power dozer was in operation for the Frazier-Davis Construction Company of St. Louis, handling final clean-up and grading for the intake chamber on the Missouri River development of the St. Louis Water Works at Hine, Mo. The blade up ahead was rotated over the axle, so to get more weight on the blade, the operator simply walked forward. To raise the blade, he stepped to the rear.

What a difference today . . . If the dozer you are comparing is the modern Eimco 105! Because even today, most other tractors still have the operator at the wrong end of his horsepower . . . nearly as far away from the blade and his work as he was in 1917!

Only the Eimco 105 puts the operator up front, where he belongs . . . where he can see what he's doing. See his work. See stumps and obstacles. Guide and work his tractor efficiently and with less fatigue, for more work output, greater safety and control. All this, plus famous Eimco rugged construction, easy maneuverability, greater stamina and more efficient and effective utilization of power through Eimco's unique power-team of modern engine - torque converter - Unidrive - Dual Final Drives.

You can't know what a **really modern** tractor can do for you unless you have job-tested the Eimco 105. Call any Eimco branch for a demonstration on your own job-site . . . or write The Eimco Corporation, P. O. Box 300, Salt Lake City 10, Utah for specifications and all the facts of modern tractor design and engineering.

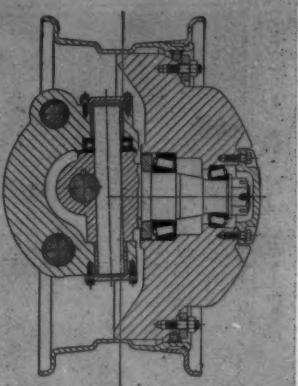
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BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD



How GALION mounts the front end assembly of the T-700 on Timken bearings.

World's largest motor grader weighs more than 20 tons—24 TIMKEN® bearings take the load

THE world's largest motor grader (above) sets up enormous loads as it slams a road into shape. And when it rolls on a steep grade, the thrust loads are even greater. To make sure their T-700 Grade-O-Matic could take all the loads, the Galion Iron Works & Manufacturing Company specified 24 Timken® tapered roller bearings—for the reverse gear case, transfer case, front wheels and king pins, and the rear wheel tandem drive.

The tapered construction of tapered roller bearings lets them take all combinations of loads—thrust as well as radial. And because they're case-carburized to produce hard, wear-resistant surfaces over tough, shock-resistant cores,

Timken bearings take the shock loads of heavy construction work. And full line contact between rollers and races gives them extra load carrying capacity to stand up to the job day after day, season after season.

Timken bearings are geometrically designed to provide true rolling motion—precision manufactured to live up to their design. They practically eliminate friction. And by holding shafts concentric with their housings, they make closures more effective—keep lubricant in, dirt out.

And to make sure we control the quality of Timken bearings all the way down the line, we even make our own steel—an extra step no other American bearing manufacturer takes.

Make sure you get all these advantages in the machines you buy or build. Specify Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".



This symbol on a product means
its bearings are the best.



TIMKEN

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